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Presented to Prof. Monier Williams
C. I. E.
With the Author's Compliments
Sept. 9th 1884

Economic Products of India

Exhibited in the Economic Court,

Calcutta International Exhibition, 1883-84.

By GEORGE WATT, M.B., C.M., F.L.S.,
Bengal Educational Service,
In charge of the Economic Court and of the Central Office, Calcutta International Exhibition of 1883-84.

Volume I.,

containing

PART I.—GUMS and RESINS.
PART II.—DYES, TANS, and MORDANTS.
PART III.—FIBRES and FIBRE-YIELDING PLANTS.
PART IV.—OILS and OIL SEEDS, PERFUMERY, and SOAPS.
INDEX.

Calcutta:
Printed by the Superintendent of Government Printing, India.
1883.

PART I.

GUMS AND RESINS.

ECONOMIC PRODUCTS OF INDIA

EXHIBITED AT THE

Calcutta International Exhibition, 1883-84.

Part I.—Gums and Resins.

ABIES.

Abies dumosa, *Loudon,* CONIFERÆ. 1

THE INDIAN HEMLOCK; SPRUCE.

Vern.—*Changathasi dhúp,* NEPAL; *Tangshing,* BHUTIA; *Semadung,* LEPCHA.

North-Eastern Kumaun, Nepal, Sikkim, between 8,000 and 10,500 feet. (*Gamble.*)

Nothing is known regarding its resinous properties.

A. Smithiana, *Forbes.* 2

THE HIMALAYAN SPRUCE FIR.

Vern.—*Rao,* HIND.; *Rewari, ban ludar,* PB., HIMALAYA; *Tos,* RAVI; *Rau,* SUTLEJ; *Kachal,* KASHMIR; *Wesha,* AFG.; *Seshing,* BHUTIA.

Found in North-Western Himalaya and the inner valleys of Sikkim and Bhutan.

It yields a resin.

A. Webbiana, *Lindl.* 3

THE HIMALAYAN SILVER FIR.

Vern.—*Paludar, badar,* HIMALAYAN NAMES; *Gobria sulah,* NEPAL; *Ragha,* KUMAUN; *Dumohing,* BHUTIA.

"Himalaya, from the Indus to Bhutan; in the North-Western Himalaya, between 7,000 and 13,000 feet; in the inner ranges of Sikkim and Bhutan, between 9,000 and 10,000 feet; in the outer ranges it does not descend below 10,000 feet." (*Gamble.*)

It yields a white resin.

ACACIA.

Acacia arabica, *Willd.*, LEGUMINOSÆ. 4

INDIAN GUM-ARABIC.

Vern.—*Bábúl, babla, kikar,* HIND., BENG. and DEC.; *Karúvelum,* TAM.; *Nella tuma,* TEL.; *Gobli,* KAN.

Wild probably in Sind, Rajputana, Guzerat, and the Northern Deccan; common everywhere throughout the plains of India.

The gum is a tolerable substitute for the true gum-arabic, but the mucilage is weak, and the red colour often objectionable. It exudes chiefly in March and April, each tree yielding about 2 lbs. In the bazars it occurs in the form of irregular and broken tears, agglutinated in masses, each tear about half an inch in size, and brown or red to light straw colour. This gum is very wholesome, and in times of scarcity is often eaten.

5 **Acacia Catechu,** *Willd.*

CATECHU or CUTCH.

Vern.—*Katha,* HIND.; *Khayer,* BENG.; *Khair,* DEC.; *Kashu-katti, wodalior,* TAM.; *Podala-manu,* TEL.; *Khadir,* SANS.; *Sha,* BURM.

Found in the Sub-Himalayan tract, westward to the Indus.

The resinous extract is used in medicine and in tanning leather, and is known as *Cutch.* It is prepared by boiling down a decoction from the chips of wood. There are three kinds of catechu met with in commerce (see *List of Medicinal Plants*). Dr. Dymock informs me that while the decoction is being boiled down twigs are at an early stage placed in the liquid. Upon these twigs a crystalline substance known as *Kath* is deposited. This is largely eaten by the natives in *pán.* After removal of the *Kath* the decoction is boiled down still further until the solid extract Cutch is obtained. *Kath* is never exported, but Cutch is largely so.

Cutch and *Kath* has, strictly speaking, no right to be placed with gums and resins, no more than indigo. It is a concentrated and solidified product of a decoction.

This plant also yields a pale yellow gum often occurring in tears one inch in diameter, generally less than half an inch in size. It is sweet to the taste and soluble in water; it forms a strong mucilage and is a better substitute for true gum-arabic than babul gum.

6 **A. Farnesiana,** *Willd.*

CASSIE.

Vern.—*Vilayati kikar, vilayati bábúl, gú kikar,* HIND.; *Gúya bábúla,* MAHR., BENG.; *Vedda vala,* TAM.; *Kusturi,* TEL.; *Jali,* KAN.; *Hnanlóngyaing, non lon kyaing,* BURM.

Cultivated all over India.

The gum is collected in Sind; the flowers yield an otto known as "Cassie" in Europe. Waring states that the gum from this plant is considered superior to gum-arabic in the arts and as a medicine.

7 **A. ferruginea,** *DC.*

Vern.—*Khour,* NEPAL; *Velvelam,* TAM.; *Ansandra,* TEL.

Grows in Northern Bengal, Central and South India and Guzerat.

It yields a good gum, similar to gum-arabic.

8 **A. lenticularis,** *Ham.*

Vern.—*Khin,* KUMAUN.

A small tree of the Siwaliks, of Kumaun, extending to the Rajmahal Hills in Bengal, and Central and South India and Burma.

Acacia leucophlœa, *Willd.* 9

Vern.—*Safed kikar,* HIND.; *Sharab-ki-kikar,* DEC.; *Aring,* RAJPUTANA; *Hevúr, pándharyá babhaliche jháda,* MAHR.; *Vel-velam,* TAM.; *Tella-túma,* TEL; *Tanaung,* BURM.

Found in the plains of the Punjab, from Lahore to Delhi, and in the forests of Central and South India and Burma.

The gum yielded by this plant is used in native medicine; it somewhat resembles gum-bassora, and received that name from **Ure.**

"In the South Mahratta country a spirit is distilled from the bark, in consequence of which the trees are farmed on account of Government." (*Dr. Dymock.*)

A. modesta, *Wall.* 10

Vern.— *Palosa,* AFG.; *Phulahi,* PB.

Found in the Suliman and Salt Ranges, the Sub-Himalayan tract, between the Indus and the Sutlej, and the northern part of the Punjab plains.

It yields a gum used in native medicine and calico-printing. It forms small, round, smooth, subtranslucent tears. I found this gum being used by the Lucknow printers under the name of *babul.* It is quite tasteless.

A. pye-nantha, *Bth.* 11

The "Golden" or "Broad-leaf" Wattle is the most valuable species for tanners' bark and gum. (*Gamble.*) **A. melanoxylon, A. dealbata,** and **A. decurrens** all give good tanning gums, the last mentioned being the Common or Black Wattle.

They are all natives of Australia, but most of them are being experimentally cultivated in India.

A. Senegal, *Willd.* 12

Vern.—*Khor,* SIND; *Kumta,* RAJPUTANA.

The tree is chiefly found in Sind and Ajmere; abundant in West Africa near the Senegal River.

It yields a gum which is collected and sold in Sind with that of **A. arabica.** This is one of the commercial forms of gum-arabic and known as White Sennar or Picked Turkey. This tree is also said to yield the white gum of the upper Nile. The gum exudes naturally from the tree in large quantities. Trade in this from Sind and Rajputana is capable of the utmost development.

A. Sundra, *DC.* 13

Vern.—*Nala sandra,* TEL.

Western Peninsula, Ceylon, and Burma.

The *Flora of British India* remarks: "This is scarcely more than a variety of **A. Catechu,** from which it differs in its fewer leaflets" and "total absence of pubescence," and in "the dark-brown colour of its branchlets."

It yields Gum Catechu of good quality.

A. vera, *Willd.* 14

Egypt, Arabia, and Northern Africa.

It produces the true gum-arabic.

ADENANTHERA.

15 **Adenanthera pavonina,** *Linn.*, LEGUMINOSÆ.

Vern.—*Rakta kambal, rakta-chandan*, BENG.; *Wál, thorali gunja*, MAHR.; *Ani kundamani*, TAM.; *Bandi gurivenda*, TEL.; *Manjadi*, KAN.; *Ywegyi*, BURM.

Found in Bengal, South India, Burma, and the Andaman Islands.

It yields a gum (*Spons' Ency.*) known in Ceylon as *madatia.*

ÆGLE.

16 **Ægle Marmelos,** *Corr.*, RUTACEÆ.

THE BAEL OR BEL FRUIT.

Vern.—*Bél*, HIND., BENG.; *Sriphal*, SANS.; *Bela, bilva*, MAHR.; *Vilvapasham*, TAM.; *Maredu*, TEL.; *Bilapatri*, KAN.; *Okshit*, BURM.

Grows in Sub Himalayan forests from the Jhelum eastward, Central and South India and Burma.

It yields a good gum, occurring in tears like gum-arabic, or in fragmentary tears resembling coarse brown sugar.

[252] **Agati grandiflora,** *Desv.* *See* **Sesbania grandiflora,** *Pers.*, LEGUMINOSÆ.

AILANTHUS.

17 **Ailanthus excelsa,** *Roxb.*, SIMARUBEÆ.

Vern.—*Maha rukh*, HIND., MAHR.; *Arúa*, N. W. P. (cultivated); *Peru-pi*, TAM.; *Pedu, pedda*, TEL.

Often planted in Central and South India.

A red gum, sent from Madras to the Punjab Exhibition, is said to have been prepared from it at Chingleput. It resembles Moringa gum, and consists of large rounded tears of a deep vinous red.

18 **A. malabarica,** *DC.*

Vern.—*Peru-mara, mati-pal*, TAM., TEL.; *Dhúp, bagádhúp*, KAN.

Planted in South India, especially on the Western Ghâts.

On incision the bark yields a dark-coloured soft resin known as *Mati-pal.*

ALBIZZIA.

19 **Albizzia amara,** *Boivin.*, LEGUMINOSÆ.

Vern.—*Lallei* or *lullai*, DEC.; *Thuringi*, TAM.; *Nallarenga*, TEL.

Grows in South India and the Deccan.

It yields a good gum.

20 **A. Lebbek,** *Benth.*

THE SIRIS TREE.

Syn.—ACACIA SIRISSA, *Roxb.*

Vern.—*Siris, Siras*, HIND., MAHR.; *Sirisha*, BENG.; *Vaghe*, TAM; *Dirasan*, TEL.; *Kal baghi*, KAN.; *Kokko*, BURM.

Grows in the Sub-Himalayan tract from the Indus eastward, Bengal, Burma, and Central and South India.

It yields a gum, which is said not to be soluble in water, but merely to form a jelly. The gum resembles gum-arabic. **Roxburgh** states that he has often seen large masses of pure gum upon this plant, while other authors give conflicting opinions regarding its properties. **Mr. Baden-Powell** says that, under the name of *lera,* it is used as an adulterant for pure gum-arabic in calico-printing and gold and silver leaf cloths.

Albizzia odoratissima, *Benth.* 21

Vern.—*Sirsa,* HIND.; *Siras,* DEC.; *Karuvaga,* TAM.; *Shinduga,* TEL.; *Pullibahgi,* KAN.; *Thitmagyi,* BURM.

Grows in the Sub-Himalayan tract from the Indus eastward, Bengal, Burma, Central and South India.

It yields a dark-brown gum in rounded tears, tasteless, and soluble in water.

A. procera, *Benth.* 22

Vern.—*Safed siris,* HIND.; *Koroi,* BENG.; *Kanalu,* DEC.; *Kinai,* MAHR.; *Karallu,* BOM.; *Konda vaghe,* TAM.; *Pedda-pattseru,* TEL.; *Sit, sit-pen,* BURM.

Found in the Sub-Himalayan tract from the Jumna eastward, Bengal, Satpura Range in the Central Provinces, Guzerat, South India, and Burma. This tree yields large quantities of gum.

A. stipulata, *Boivin.* 23

Vern.—*Siran, samsundra,* HIND.; *Chakua, amluki,* BENG.; *Oi, oë, shirsha,* PB.; *Udula,* MAHR.; *Kat turanji,* TAM.; *Kal baghi,* KAN.; *Kabal,* CINGH.; *Bonmésa,* BURM.

Sub-Himalayan tract, Oudh, Bengal, South India and Burma.

It yields a gum, which exudes copiously from the stem, and is used by the Nepalese for sizing their " Daphne" paper.

ALSTONIA.

Alstonia scholaris, *R. Br.,* APOCYNACEÆ. 24

Vern.—*Satián, chatián, satwin, satni,* HIND.; *Chatwan, chatinn,* BENG.; *Purbo,* LEPCHA; *Satiana,* ASS.; *Sattni,* CACHAR; *Sántávin,* MAHR.; *Pala, wodrase,* TAM.; *Eda-kula,* TEL.; *Janthalla,* KAN.; *Let-tóp,* BURM.

A tall, evergreen tree, widely cultivated throughout India, and exceedingly useful as it is highly ornamental.

It yields an inferior quality of Caoutchouc or Gutta-percha, which see.

ALTINGIA.

Altingia excelsa, *Noronha,* HAMAMELIDEÆ. 25

Syn.—LIQUIDAMBAR ALTINGIA, *Bl.*

Vern.—*Siláras,* HIND.; *Intili,* ASS.; *Méaahe-sáyelah,* ARAB.; *Asle-lubni* PERS.; *Neriuriship-pál,* TAM.; *Shila-vasam,* TEL.; *Seláras,* GUZ.; *Nan-ta-yok,* BURM.

A magnificent tree of the Indian Archipelago, Burma, Assam and Bhutan; quite abundant in the Tenasserim Province of Burma.

In Java it yields in small quantity an odorous resin, known in Europe under the name *Storax*, and which is obtained by incisions in the trunk, but is not regularly cultivated. In Burma, the tree is said in the *Pharmacographia* to afford a fragrant balsam of two varieties: one pellucid and of a light yellowish colour, obtained by simple incision; and the other, dark, opaque and of terebinthinous odour, procured by boring the stem and applying fire around the trunk. *See* **Liquidambar orientalis.**

AMBER.

26 **Amber.**

A fossilized resin, yielded by trees (?) chiefly pines which grew during the cretaceous period of geologists, usually found in connection with tertiary lignites. It is hard, brittle, easily cut, of various shades of yellow, and semi-transparent. It is very useful to the physicist, becoming negatively electric by friction. The Amber supply is chiefly from the Baltic region, Samland being the great centre. Crude Amber occurs in commerce in irregular pieces. When ground or heated it emits a pleasant odour. It is completely soluble in alkaline solutions containing camphor. On being boiled for 20 hours in rape or linseed-oil, it becomes transparent and ductile, and may then be moulded into any desired form. It is chiefly used for ornamental purposes, for mouthpieces of pipes and cigar-holders, for the preparation of a varnish, and for the manufacture of amber-oil and succinic acid. *See* **Varnish** and also **Gum Copal.**

[124] **Ammoniacum.** *See* **Dorema Ammoniacum,** UMBELLIFERÆ.

[230] **Amygdalus communis,** *Linn. See* **Prunus Amygdalus,** *Baill.*, ROSACEÆ.

ANACARDIUM.

27 **Anacardium occidentale,** *Linn.*, ANACARDIACEÆ.

CASHEW NUT.

Vern.—*Kajú,* MAHR., HIND.; *Hijli bádám,* BENG.; *Mundiri kottai,* TAM.; *Jidi mamidi,* TEL.; *Thi-ho-thayet,* BURM.

Now established in the coast forests of Chittagong, Tenasserim, the Andaman Islands, and South India, near the sea; naturalised from America, Ceylon, &c.

Rai Kanai Lal De Bahadur, in his *Indigenous Drugs of India,* mentions that the bark of this plant yields a gum.

"This gum occurs in large stalactitic pieces; it is yellow or reddish and only slightly soluble in water. It is obnoxious to insects." (*Dr. Dymock.*)

ANOGEISSUS.

28 **Anogeissus latifolia,** *Wall.*, COMBRETACEÆ.

Vern.—*Dháwa, dhaura, bákli,* HIND.; *Dábriá,* GUZ.; *Golra,* RAJPUTANA; *Daura,* MAHR.; *Vellay naga,* TAM.; *Sheriman,* TEL.; *Dinduga,* KAN.

Found in the Sub-Himalayan tract from the Ravi eastward, and Central and South India; very plentiful in Melghat.

ARABIC GUM.

It yields a gum, which is extensively sold for use in calico-printing. It occurs in clear straw-coloured elongated tears adhering into masses, sometimes honey-coloured or even brown from impurities. As an adhesive gum it is inferior in strength to gum-arabic, in consequence of which it commands a much lower price in Europe, the more so since it is nearly always mixed with the bark of the tree, sand and other impurities, and adulterated with the brown tears which are probably derived from some other plant than **Anogeissus.** In India the reputation of this gum stands high with the calico-printers, especially of Lucknow, and it is probable it possesses some specific peculiarity justifying this preference, since it is used with certain dye-stuffs, such as with *haldi* **(Curcuma longa),** while gum-arabic or *babul* is used with Madder **(Rubia cordifolia).** *Dhawa* or *bakli* gum is generally collected in April.

ANTIARIS.

Antiaris toxicaria, *Leech*, URTICACEÆ. 29

THE UPAS TREE.

Vern.—*Jasúnd, rúkhá, chándala, chándakudá*, BOM.; *Alli, netavil*, TAM.; *Jasúgri, karwat, jagúri*, KAN.; *Riti*, CINGH.; *Hmya-seik*, BURM.

A large, evergreen tree of Burma, the Western Ghâts and Ceylon.

It exudes a white, poisonous resin, used for poisoning arrows. (*Gamble.*) Specimens and further information much required.

APOROSA.

Aporosa villosa, *Baill.*, EUPHORBIACEÆ. 30

Vern.—*Ya-mein*, BURM.

A tree frequent in the Eng. forests of Burma from Pegu to Martaban. (*Kurz.*)

Yields a red resin, and the bark is used as a red dye.

AQUILARIA.

Aquilaria Agallocha, *Roxb.*, THYMELACEÆ. 31

AGALLOCHA, OF ALOE-WOOD, OF EAGLE-WOOD.

Vern.—*Agar*, HIND., BOM.; *Agaru*, BENG.; *Vel-i-Hind*, PERS.; *Aggali-chandana*, TAM.; *Agru*, TEL.; *Akyaw*, BURM.

A large tree of Sylhet and Tenasserim; distributed to the Malay Peninsula and Archipelago.

Wood impregnated with an odorous resin, the much-prized *Agallocha.*

Arabic Gum. [12]

There are many plants yielding the valuable commercial gum, of which the following may be mentioned—

1st.—Picked Turkey or White Sennar. This is obtained from **Acacia Senegal.**

2nd.—Senegal. This is the produce of the same tree as the preceding, but is obtained from the French colony of Senegal.

3rd.—Saukin or Talca. This is the produce of **A. Stenocarpa,** the best quality coming from Sennar on the Blue Nile. Large quantities are imported into Alexandria and Suez.

4th.—Morocco or Brown Barbary. This is the produce of **A. Gummifera.**

5th.—East Indian Gum. The gum which reaches Europe under this name is not of Indian origin. It is shipped from Aden or imported into Bombay and reshipped to Europe, and hence bears the name of East Indian Gum. Several Indian plants, but chiefly **A. Arabica,** do, however, yield gum-arabic, but they are consumed locally.

6th.—Australian Wattle Gum.

ARECA.

32 **Areca Catechu,** *Linn.*, PALMÆ.

ARECA NUT OR BETEL PALM.

Vern.—*Supári,* HIND.; *Supári, guá,* BENG.; *Gubák,* SANS.; *Sapári,* MAHR.; *Kottai pakka,* TAM.; *Poka-vakka,* TEL.; *Adiki,* KAN.; *Kun* or *Kunthibin,* BURM.

Cultivated throughout Tropical India.

A decoction of the nut yields an inferior resinous extract, known sometimes as "Areca Catechu."

ARGEMONE.

33 **Argemone mexicana,** *Linn.*, PAPAVERACEÆ.

THE MEXICAN POPPY.

Vern.—*Buro-shiálkánta,* BENG.; *Bharbhurwa, kantela,* N. W. P.; *Kandiári, katelí, bhat kateya,* PB.; *Brahmadundie,* SANS.; *Farangidhatura, bharamdandi, dárúri, kante-dhotura,* DEC., BOM.; *Khyáa,* BURM.

A spiny, herbaceous plant springing up in the cold season and introduced into India within historic times.

The milky sap, on drying, forms a substance resembling opium.

ARTOCARPUS.

34 **Artocarpus Chaplasha,** *Roxb.*, URTICACEÆ.

Vern.—*Chaplash,* BENG.; *Sam,* ASS.; *Lut-ter,* NEPAL; *Kaita-da,* AND. *Toung-peinné,* BURM.

Met with in Eastern Bengal, Burma, and the Andaman Islands.

Kurz remarks that in Burma it yields a tenacious milky Caoutchouc.

35 **A. hirsuta,** *Lamk.*

THE WILD JACK TREE.

Vern.—*Rán-phanasá, hebalsu, pat-phanas,* MAHR.; *Ayni, anjalli,* TAM.; *Aini, ansjeni,* MAL.; *Hebalsu, hesswa,* KAN.

A lofty tree of the forests of the Western Ghâts, ascending to 4,000 feet in altitude.

"The concreted juice forms a waxy, tough, light brown substance, which, when melted, is used as a cement to join broken earthen-ware and stoneware." (*Dymock.*)

Artocarpus incisa, *Linn.* 36

THE BREAD FRUIT TREE of the South Sea Island.

Cultivated in South India, Ceylon, and Burma.
Yields the gum known in Ceylon as *Ratadel.*

A. integrifolia, *Linn.* 37

THE JACK FRUIT TREE.

Vern.—*Panas,* HIND.; *Kánthál,* BENG.; *Panasa,* SANS.; *Phanasá,* MAHR.; *Pilla,* TAM.; *Palah-maram,* TEL.; *Peinne,* BURM.

Cultivated throughout India, and wild in the mountain forests of the Western Ghâts.

The bark yields a very dark-looking gum, with a resinous fracture, soluble in water. (*Atkinson's Gums and Resins.*) The juice is used as a valuable bird-lime and as a cement.

A. Lakoocha, *Roxb.* 38

Vern.—*Barhal,* HIND.; *Dephal,* BENG.; *Tiún,* PB.; *Lakucha,* SANS.; *Lowi,* DEC.; *Kammaregu,* TEL.; *Myauklót,* BURM.

Outer hills of Kumaun, Sikkim, Eastern Bengal and Burma.
A gum similar to the preceding is obtained from it.

Asafœtida. *See* **Ferula Narthex,** *Boiss.,* UMBELLIFERÆ. [145]

ASTRAGALUS.

Astragalus? sp., LEGUMINOSÆ. 39

A gum is exported from Persia into Bombay which **Dr. Dymock** regards as the true Sarcocolla of the ancients, and there would seem much to favour this idea. The gum is known as *Anzeroot,* ARAB. and PERS.; *Gujar,* BOM. **Meer Muhammad Husein,** in his *Makhsan-ul-Adwiya,* describes the plant which yields this gum as a small thorny shrub known as *Shayakah,* a native of Persia and Turkistan.

For some time Sarcocolla was supposed to be obtained from **Penæa** (Sarcocolla) **mucronata,** a native of the Cape of Good Hope. It is known to come from Persia, and it cannot therefore be obtained from species of **Penæa** or Sarcocolla plants, which are found in the south of Africa. **Mr. Baden-Powell** mentions **Penæa** in his *Punjab Products,* but, as pointed out by **Dr. Dymock,** it is entirely imported into India, coming from the Persian Gulf. The medicinal virtues of Sarcocolla have long been much admired by the natives of India, either made into an ointment and plaster, or into a medicated oil. It is one of the chief ingredients of the Parsee bone-setter's plaster (*lep*). The gum is described as aperient, and a resolvent of corrupt and phlegmatic humours, acting best when combined with myrabolans or sagapenum. It is also supposed to be fattening, and is therefore eaten by the Egyptian women. This exceedingly useful gum, which is widely consumed in the East, does not seem to have attracted the attention of Europe to the extent which it deserves.

Balata gum. *See* **Miusops Manilkara,** *Don.,* SAPOTACEÆ. [198]

BALSAMODENDRON.

Balsamodendron Berryi, *Arnott,* BURSERACEÆ. 40

Vern.—?

A tree of the forests on the east side of the Nilgiris.
It is very fragrant, and yields a gum-resin.

41 **Balsamodendron Mukul,** *Hook.*

Gum Gugal.

Vern.—*Guggul, mukul,* Beng., Hind., and Dec.

Arid zones of Sind, Kattiawar, Rajputana, and Khandesh.

Yields the gum-resin known as *Gugul* and also as *Indian Bdellium.* It occurs in vermicular or stalactitic pieces, is of a brown or dull green colour, and has a bitter, acrid taste. It is not brittle, and swells when heated, diffusing a disagreeable odour. It is also used in medicines like Myrrh.

42 **B. Myrrha,** *Nees.*

Vern.—*Hirábol, bol,* Beng., Bom., Hind.; *Vola,* Sans.; *Bellaip-polam,* Tam.

This is at least one of the trees from which the Myrrh of commerce is obtained, but it does not seem to be determined whether **B. Myrrha** is the plant which yields the true Myrrh or not. The article occurs in the form of tears of irregular shape and variable size: it is somewhat translucent, of a reddish-yellow or reddish-brown colour, has an agreeable, aromatic odour, and a bitter, acrid taste. It is partly soluble in water, alcohol and ether, and is chiefly used in medicine.

In Bombay—the great emporium of Myrrh—**Dr. Dymock** informs me there are four kinds met with in the bazars, *viz.*:—

(1) the African Myrrh, known in Bombay as *karam* or *bander-karam;* this is regarded as the true Myrrh, or that of best quality. On the bags containing Myrrh arriving from Africa they are opened and sorted into four kinds, of which the best qualities are re-exported to Europe;

(2) Arabian, or *meetiya,* mostly sold in Bombay as true Myrrh, for which it might easily be mistaken;

(3) the Siam Myrrh, also called *meetiya,* from which it can hardly be distinguished; it is largely imported in Calcutta and Bombay, where it is known as *chinai-bol;*

(4) the Persian Myrrh, the source of which is unknown: in 1882, **Dr. Dymock** informs me, 1,000 cwts. were imported into Bombay.

43 **B. Opobalsamum,** *Kunth.*

Balm of Gilead.

Vern.—*Balesán,* Arab., Hind.

The famous Balm of Gilead or Balsam of Mecca is imported into Bombay from Arabia. It is a greenish-yellow oleo-resin of the consistence of honey, used as a perfume and in medicine. The wood *Ud-i-Balesan* and the fruit *Tukm-i-Balesan* are also imported, and are chiefly used as medicines by the Yunani Hakims of India. (*Dymock.*)

44 **B. Playfairii,** *Hook, f.*

Opaque Bdellium.

Vern.—*Hotal,* Somali; *Dukh,* Arab.; *Meena-harma,* Bom.

Met with in North-East Africa.

Yields an opaque, whitish gum-resin, which is used as a soap by the Arabs and Somalis to kill lice, and in Bombay in the cure of guinea-worm.

Balsamadendron pubescens, *Stocks.* 45

Vern.—*Bayi, bai,* BELUCHI.

A small tree of Beluchistan, and the hills separating that country from Sind, as far as Karachi.

It yields a small quantity of tasteless, inodorous, brittle gum, almost entirely soluble in water.

B. Roxburghii, *Arn.* 46

Vern.—*Gugala,* BENG.; *Gugal,* BOM.

A small tree of Eastern Bengal, Assam and Berars.

It yields a gum-resin of a greenish colour, moist and easily broken, having a peculiar cedar-like odour; it is largely supplied to the Bombay market from Oomraoti, and is much used by masons to mix with fine plaster. (*Dymock.*)

BARLERIA.

Barleria prionitis, *Linn.*, ACANTHACEÆ. 47

Vern.—*Kalasunda, vajradanti,* MAR.

Madras, Negapatam, the Circars, Kutallam, Dindigul; the Concans; also Assam, Sylhet and Ceylon.

Referred to by **Mr. Baden-Powell**—(*Punj. Prod.*, I, 412)—as one of the beautiful dark red-brown or black gums apparently contributed by Madras to the late Punjab Exhibition of 1864.

"The gum alluded to above by **Mr. Baden-Powell** is most probably a preparation from the juice. When fresh it is yellow, but afterwards turns black. It is much used by the cultivators in Bombay to preserve the sole of the foot from the cracks which are so common in the monsoons." (*Dymock.*)

BASSIA.

Bassia latifolia, *Roxb.*, SAPOTACEÆ. 48

Vern.—*Mahúa,* HIND.; *Mahwa,* BENG.; *Madhuka,* SANS.; *Katillipi,* TAM.; *Ippi,* TEL.; *Honge,* KAN.; *Bonam,* MAL.

The well-known *Mahúa* tree; indigenous in the forests of Central India, cultivated and self-sown throughout the warmer regions of India; very gregarious; often associated with the *Sál.*

It yields a white milky gum from incisions and from cracks in the bark. The discharge of gum is facilitated by a process of ringing the trees practised in Chutia Nagpur during the fruiting season. The gum does not seem to be of any economic value.

B. longifolia, *Willd.* 49

Vern.—*Kat illupi, elupa,* TAM.; *Ippi, pinna,* TEL.; *Hippe,* KAN.; *Mu,* CINGH.

An evergreen tree of South India, and the Coromandel and Malabar Coasts. This is the *Mahua* of Guzerat.

Yields an inferior gum known as *Ellopa.*

B. Mottleyana, *De Vriese.* 50

A tree met with in Malacca and Borneo known as *Kotian,* and said to yield a copious milk juice, which hardens into a kind of Gutta-percha, which see.

BAUHINIA.

BAUHINIA.

51 **Bauhinia malabarica,** *Roxb.*, LEGUMINOSÆ.

Vern.—*Amli, amlosa,* HIND.; *Karmai,* BENG.; *Kattra,* ASS.; *Korala,* MAR.; *Pulla dondur,* TEL.; *Cheppura,* KAN.; *Bwéchin,* BURM.

Sub-Himalayan tract, from the Ganges to Assam, Bengal, Burma, and South India.

The leaves of this tree are very acrid; they are eaten by people in Burma. (*Brandis.*)

"The young shoots which appear just before the rains are used as a vegetable in the Konkan; when cooked they are slightly bitter but very palatable." (*Dymock.*)

52 **B. purpurea,** *Linn.*

Vern.—*Koliár,* HIND.; *Rakta-kánchan,* BENG.; *Devakánchaná,* MAHR.; *Pedda-aré,* TAM.; *Sarul,* KAN.; *Mahahlegani,* BURM.

Grows in the Sub-Himalayan tract, from the Indus eastward, Central and South India, and Burma.

Yields a gum called *Semki-gond.*

53 **B. racemosa,** *Lam.*

Syn.—B. PARVIFLORA, *Vahl.*

Vern.—*Kachnál, gúriál, ashta, makkúna, thaur, dhorára,* HIND.; *Banraj,* BENG.; *Kosúndra, taur,* PB.; *Dhondri, bosha,* GOND.; *Jhinja,* AJMERE; *Ambhola,* URIYA; *Apata, vanarája,* MAHR.; *Ari, arro,* TEL.; *Ati, areka,* TAM.; *Palan,* BURM.

Sub-Himalayan tract, from the Ravi eastward, Oudh, Bengal, Burma, and Central and South India.

It yields a gum of which little is at present known.

54 **B. retusa,** *Ham.*

Vern.—*Kandla, semla, gwayral, kanalla, kanlas,* HIND.; *Kurál,* PB.; *Nirpa,* TEL. and GOND.

Found in the North-Western Himalaya, from the Beas eastward, and in Central India.

It yields a clear gum called *Semla Gum,* almost exactly resembling gum-arabic. It is eaten by the poorer classes, and is used to waterproof terraced roofs.

55 **B. Vahlii,** *W. & A.*

Vern.—*Maljan, malghán, malu, maurain, jallur,* HIND.; *Chehur,* BENG.; *Shioli,* URIYA; *Sungung rik,* LEPCHA; *Chambúra, chambúli,* MAHR.; *Chambuli,* DEC.; *Adda,* TAM.

Sub-Himalyan tract, North and Central India, and Tenasserim.

Yields a copious gum which seems to be of little use.

56 **B. variegata,** *Linn.*

Vern.—*Kachnár, koliár, kurál, kaniár, kándan, khairwál,* HIND., PADRIAN; *Rakta kánchan,* BENG.; *Borara,* URIYA; *Rha,* LEPCHA; *Kánchana,* MAHR.; *Segapumunthari,* TAM.; *Kanchivalo-do,* KAN.; *Bwéchin,* BURM.

A small tree met with on the Himalaya fro the Indus eastward and in the forests of India and Burma.

This tree, like most other members of the genus, yields the gum known as *Sem* or *Semla*. It is a brown-coloured gum. *Sem-ki-gond* is, in fact, a sort of generic name for the gum obtained from the species of **Bauhinia.** It swells in water like cherry-tree gum, a very small proportion only being soluble.

Bdellium, a myrrh-like resin, of which there are three kinds :— 57

1st.—Indian, the produce of **Balsamodendron Mukul,** *Hook.*, in Sind, in Sylhet and Assam. This substance is obtained from **B. Roxburghii** and in Beluchistan from **B. pubescens.**

Mukul or Gugal (Indian Bdellium) from Coromandel is the produce of **Boswellia glabra,** and that from the Western Himalaya is the produce of **Boswellia serrata.**

2nd —African Bdellium. This is now believed to be the produce of **Hemprichia erythræa,** *Ehernb.* (a synonym for **Balsamodendron Katal,** *Kunth.*) It to a certain extent resembles Myrrh, but is of a darker colour. It is twice the price of the Indian Bdellium.

Both this and the preceding are given to buffaloes to increase their milk.

3rd.—The Opaque Bdellium. This is the produce of **Balsamodendron Playfairii,** *Hook.*, which see.

Benzoin or **Benjamin.** *See* **Styrax Benzoin,** *Dyand,* STYRACEÆ. [266]

BERBERIS.

Berberis Lycium, *Royle,* BERBERIDEÆ. 58

Vern.—*Kashmal, chotra,* HIND.; *Kushmul,* N. W. P.; *Kasmal,* SIMLA; *Darhalad* (the wood), BOM.; *Ziriskh* (the fruit), PERS., and *ambarbarees,* ARAB.; *Raswanti* (the extract).

B. aristata, *DC.*, **B. asiatica,** *Roxb.*, and **B. vulgaris,** *Linn.*, can scarcely be distinguished from **B. Lycium,** *L.*, even by botanists, and may therefore be expected to be used indiscriminately by the natives. They are thorny bushes, common along the Himalayas, **B. asiatica,** *Roxb.*, coming down to the lower hills of the plains. **Royle** says that from **B. Lycium,** *L.*, is prepared the extract known as *Rasat, rasaut, rusot* in Hindi, or *Rasanjana* in Sanskrit.

The Sanskrit name *Darvi* is, in South India, applied to **Coscinium fenestratum,** *Colebrook ;* but in Northern India it is applied to a species of **Berberis.**

BLUMEA.

Blumea balsamifera, *DC.*, COMPOSITÆ. 59

Syn.—CONYZA BALSAMIFERA, *Linn.*
Vern.—*Pon ma thein,* BURM.

A sub-bushy plant met with on the tropical Himalaya from Nepal to Sikkim, altitude 1,000 to 4,000 feet, extending to Assam, Khâsia Hills, Chittagong, Burma, and the Straits. The whole plant smells strongly of camphor, which may indeed be prepared from it. A warm infusion acts as a pleasant sudorific, and it is useful expectorant as a decoction. **Dymock** says that in Bombay the vernacular name *bhambarda* is a generic term for all **Blumeas.**

60 **Blumea densiflora,** *DC.*

Syn.—B. GRANDIS, *DC.*

Vern.—*Pung-ma-theing*, BURM.

Found in Tropical Himalaya, Sikkim and Assam, Mishmi and Naga Hills and Khásia Mountains; also met with in the Tenasserim Province.

A few years ago **Mr. E. O'Riley** prepared camphor from this plant which was pronounced identical with that imported from China.

BOMBAX.

61 **Bombax insigne,** *Wall.*

Vern.—*Semul, thula,* BENG.

Burma, Pegu, and the Andaman Islands.

The wood is more durable than the preceding. It yields a brown gum.

62 **B. malabaricum,** *DC.*, MALVACEÆ.

THE SILK COTTON TREE.

Vern.—*Semul, simul, simal, shembal,* HIND., BENG.; *Simbal, shirlan,* HIMALAYAN NAMES; *Salmali,* SANS.; *Bolchú,* GARO; *Bouro,* URIYA; *Savara,* MAHR.; *Illavam, pulá,* TAM.; *Búrga,* TEL.; *Letpan, didu,* BURM.

Throughout India and Burma, ascending the Himalayas to 4,000 feet in altitude; chiefly met with in the hotter forests of East India.

It yields a brown gum (mocha-ras, *i.e.*, juice of mocha) used in native medicine. This belongs to the dark or **Moringa** series, and, like the other false Tragacanth gums, is of little commercial value.

BORASSUS.

63 **Borassus flabelliformis,** *Linn.*, PALMÆ.

THE PALMYRA PALM.

Vern.—*Tál, tála, tár,* HIND.; *Tál,* BENG.; *Tada,* MAHR.; *Panam, pannie,* TAM.; *Potu tádi* (the male tree), *Penti tadi* (the female), TEL.; *Tád,* GUZ.; *Tan,* BURM.

Cultivated throughout tropical India, and beyond the tropics in Bengal, and the southern part of the North-West Provinces.

Gum obtained from it is said to have been sent from Madras to the Punjab Exhibition; it is black and has a black shining fracture. (*Brandis.*) It deserves more careful examination.

BOSWELLIA.

64 **Boswellia floribunda,** *Endl.*, BURSERACEÆ.

THE TRUE FRANKINCENSE or OLIBANUM of European Commerce.

Vern.—*Kundur, lubán, thus,* ARAB., HIND.; *Kunduru,* SANS.; *Visesh, esesh,* BOM.; *Parangi-shambirani,* TAM.

BOSWELLIA.

It is probable that not merely the above but several other species yield Olibanum, of which **B. Carterii** is probably the most important. They are trees inhabiting the Somali Coast of Africa to Cape Guardafui and also the South Coast of Arabia.

The Arabs, as early as the 10th century, carried Olibanum to India, and the Indian names for it have, through the lapse of time, become almost hopelessly mixed up with those given to the Indian species of this genus, and also with those given to the **Balsamodendrons.** It is impossible therefore to definitely fix the names of the balsamiferous plants, and Mahomedan writers distinguish several kinds of the imported or African and Arabian Olibanum :—

1st.—Kundur Zakur or male Frankincense. This is esteemed the best quality and consists of deep yellow tears. It should burn readily and not emit much smoke.

2nd.—Kundur Unsa or female Frankincense.

3rd.—Kundur Madharaj. This consists of artificially-prepared tears, made by shaking the moist exudation in a basket.

4th.—Kishur Kundur, or *Kashfa.* This consists of the bark of the tree coated with the exudation. This is the *Dhúp* of the Bombay market, and, under that name, forms a distinct article of commerce.

5th.—Dukak Kundar, or dust of Olibanum. This meets the demand of the Indian and Chinese markets, the finer qualities of Olibanum being exported from Bombay, after assortment, to Europe.

Olibanum, as met with in European commerce, may be described as a dry gum-resin, consisting of tears often an inch in length, and of an ovate or oblong, clavate or stalactitic form, and mixed with impurities. The pieces are light yellow to brown or pale green or colourless. The odour is balsamic and resinous, especially while being burned. In taste it is bitter and terebinthinous, softening in the mouth. By heat it softens without actually fusing, decomposing at high temperatures.

Boswellia Frereana, *Birdw.* 65

Vern.—*Luban meyeti,* ARAB.; *Pándhri visesh,* BOM.

This is the plant which yields the stalactitic Olibanum, a substance which differs chiefly from the preceding in the absence of soluble gum. It resembles **Elemi.**

B. serrata, *Roxb.*

Syn.—B. THURIFERA, *Roxb. ex Fleming;* LIBANUS THURIFERA, *Coleberooke.*

Vern.—*Salpe, salei, sale, sálga, gunda birsoand, ? lúban,* HIND.; *Salai,* BENG.; *Sallaki, guggulu,* SANS.; *Salaphali,* MAHR.; *Kungli, gugulu, morada,* TAM.; *Anduku, anduga, parangi,* TEL.; *Chittu,* KAN.

It is probable that the name *Gugul* should have been restricted to this plant, but modern use has extended it to include **Balsamodendron Mukul.** There are two varieties of this plant, both of which yield the so-called Indian Olibanum.

1st.—serrata proper. 66

A moderate-sized tree of the forests at the base of the Western Himalaya, from the Sutlej to Nepal southward to the Deccan, the Circars and the Konkans.

This is **B. thurifera,** *Roxb.*, and is characterised by the *leaflets* being sessile, pubescent, coarsely crenate; serrate *racemes; axillary* shorter than the leaves.

The gum-resin, *Salai gugul,* occurs as a transparent golden yellow, semi-fluid substance, which slowly hardens with lime. **Mr. Moodeen Shariff** says that when it is found in this massive form it is known as

Gandahferosah. It is pungent, having a slightly aromatic taste and balsamic resinous odour. It becomes opaque when immersed in alcohol or in water, the proportion of resin to gum being much smaller than in Frankincense. The opaque, soft, whitish mass produced by water when rubbed in a mortar forms an emulsion. Indian Olibanum is consumed almost entirely in Central and Northern India, and it is never exported.

67 **2nd.—glabra sp.,** *Roxb.*

Vern.—*Gúgúlápú-chittu, gugil,* TEL.

A moderate-sized tree of North-West India. *Leaflets* nearly or quite glabrous, and generally entire or nearly so; *racemes* terminal, subpanicled.

It seems probable that this form yields the solid rounded pieces or tears described by some authors as of Indian origin, owing to its drying more rapidly than the gum-resin from **B. serrata.** **Royle** describes picking tears off the trees, and states that these burn rapidly with a bright light, diffusing a pleasant odour.

For further particulars regarding Frankincense, the reader is referred to **Dr. Dymock's** *Materia Medica of Western India* (from which much of the above information has been obtained); to **Dr. Birdwood's** *Monograph of the Genus Boswellia in the Linnæan Society's Transactions, XXVII;* to the *Pharmacographia (p. 120);* **Royle's** *Illustrations of the Botany of the Himalaya, p. 177;* **Ainslie,** *Vol. I, p. 136;* **Spons'** *Encyclopædia.*

BUCHANANIA.

68 **Buchanania latifolia,** *Roxb.,* ANACARDIACEÆ.

Vern.—*Chirauli* or *Chironji,* PB.; *Piál, muriá, katbhilawa, payála,* GARHWAL; *Piár, paira, pérrah,* OUDH; *Charu,* URIYA; *Piyál, chároli,* BOM.; *Kat maá, aima,* TAM.; *Chara, chinna moral, morli,* TEL.; *Lunbo, loneopomáa,* BURM.

Grows in the Sub-Himalayan tract, from the Sutlej eastward.

A pellucid gum exudes from wounds on the stem (*Brandis*), more than half soluble in water. It is reported to resemble *Bassora Gum.*

It is described as in irregular broken fragments, brittle, pale, horn-coloured, tinged with brown, tasteless, soluble in water, except a small insoluble portion of basorine. It has been pronounced as having adhesive properties, similar to the inferior kinds of gum-arabic, and suitable for dressing of textiles. The bark is also said to yield a natural varnish.

BUTEA.

69 **Butea frondosa,** *Roxb.,* LEGUMINOSÆ.

Vern.—*Dhák, palás, kankrei, chichra,* HIND.; *Palás,* BENG.; *Palási, bulyeltra,* NEPAL; *Lahokúng,* LEPCHA; *Kinsuka,* SANS.; *Porásu,* URIYA; *Pallás,* DEC.; *Palasa, khákará,* BOM.; *Porasan,* TAM.; *Modugu,* TEL.; *Muttúgu, thorás,* KAN.; *Pauk,* BURM.

Found throughout India and Burma, extending in the North-Western Himalaya as far as the Jhelam.

It yields a gum which is sold as "Bengal Kino." It occurs in the form of round tears, often fragmentary. It may be purified by solution in water. It is of a brilliant ruby-red colour, translucentand brittle, heat rendering it more so instead of melting it. This gum is generally known as *kamarkas* in the N. W. P. bazars. With age the gum darkens and becomes opaque. In native medicine it is largely used as an astringent as a substitute for true Kino. It is also largely used in tanning.

An aqueous solution of this gum is, by the action of persulphate of iron, changed into a dirty green colour; a larger quantity occasions a green precipitate. Acids precipitate an orange or dirty yellow pigment from the solution. A few drops of caustic potash change the colour to crimson, becoming grey with excess, until the whole of the colour is destroyed. Similar changes are effected by the action of caustic soda and ammonia. The addition of carbonates of potash and soda deepens the colour of the solution, but not so much as caustic potash does. Metallic solutions like acetate of lead precipitate the whole of the colouring matter. Attempts were made to fix the colour in the fibre of cotton, silk, wool, &c., with different mordants, but the colours, though permanent, were all imperfect. This gum, by experiment, has been found to contain a large portion of tannin. This fact, together with its cheapness, shows that it would be highly valued in the arts, especially in that of tanning leather. It is said also to be used in purifying indigo.

Butea superba, *Roxb.* 70

Vern.—*Palása vela,* MAR.; *Yél parás,* MARTABAN; *Tige motku,* TEL.; *Samur,* GOND; *Pauknwé,* BURM.

A large climber of India and Burma.

It yields a gum like that of **B. frondosa.**

CALAMUS.

Calamus (Dæmonorops) Draco, *Willd.*, PALMÆ. 71

Vern.—*Dam-ul-akhwain, jaida rumi, hirada khum,* HIND.; *Hirá dakhana,* MAR.

A native of the Indian Archipelago.

The drug is sold in dark-red, friable masses, from which a blood-red powder is obtained; often sold in the bazar in the interior of canes. This climber yields the Dragon's-blood of the *Indian Materia Medica.*

The fruits are clustered, each covered with beautiful imbricating scales, which are coated with a red, resinous substance. The fruits are placed in long bags and violently shaken; the resinous powder is thus separated and (as it reaches Europe) it is baked into sticks or cakes. Other species of **Calamus** also yield the Dragon's-blood, and from **Dracœna Draco,** a tree of the **Liliaceæ** and a native of the west coast of Africa, a similar substance is obtained. This is met with as a secretion at the base of the leaves. Dragon's-blood is used in varnishing and staining wood.

A similar substance is also said to be obtained from **Pterocarpus Draco,** a tree of the West Indies and South America.

CALOPHYLLUM.

Calophyllum inophyllum, *Linn.*, GUTTIFERÆ. 72

THE ALEXANDRIAN LAUREL.

Vern.—*Sultana champa,* HIND., BENG.; *Surangi, undi (purraya, dugur-phort),* SIND; *Pinnay,* TAM.; *Púna, púnás,* TEL.; *Wúma,* KAN.; *Undi, surangi,* MAR.; *Domba,* CINGH.; *Ponnyet,* BURM.

Cultivated in the Western Peninsula, Orissa, South India, Ceylon, Burma, and the Andaman Islands.

It yields a black resin, greenish when powdered, which was sent from Madras to the Punjab Exhibition. (*See Baden-Powell's Punjab Products.*) **Dr. Dymock** informs me that he has prepared the gum by incising a tree, and that the yield was about an ounce of yellowish-green translucent gum. He further states that it is also obtained from the fruit in small quantities, chiefly in the form of very small tears. **Mr. Gamble,** citing *Les Bois de la Nouvelle Calédonie,* SEBERT, remarks that it gives a yellowish green pleasantly scented resin.

This resin is very little known in India, and specimens are much required.

73 **Calophyllum tomentosum,** *Wight.*

THE POON SPAR TREE.

Vern.—*Poon, sirpon,* BOM.; *Poon, poone,* MAL.; *Pongoo,* TAM.; *Sira pone,* KAN.

A large, tall tree of the moist forests of the Western Peninsula, from the Koncan southward; Ceylon, ascending to altitude 5,000 feet.

Dr. Dymock informs me this tree yields a black, opaque gum, much mixed with pieces of bark; feebly astringent, and very soluble in cold water. The solution is brownish-yellow, exhibiting a strong blue florescence.

CALOTROPIS.

74 **Calotropis gigantea,** *R. Br.,* ASCLEPIADEÆ.

Vern.—*Madár, safed-ak,* HIND.; *Akand, swet-akand,* BENG.; *Auk,* NEPAL; *Akandá, rúi,* MAR.; *Uk,* SIND; *Yercum,* TAM.; *Yekka,* KAN.; *Mayobeng, ma-yo-pin,* BURM.

Grows in waste lands all over India.

Yields Gutta-percha. A specimen was sent from Madras to the Punjab Exhibition. **Dr. Riddel** (*Journ. Agri.-Hort. Society of India, Vol. VIII*) first drew attention to this gutta, and was followed by **Royle** in his *Fibrous Plants,* and still later by **Mr. Baden-Powell** in his *Punjab Products. See* next species.

75 **C. procera,** *R. Br.*

Vern.—*Ak mudár,* HIND.; *Spalwakka,* AFG.

Found in the drier parts of India, chiefly in the Sub-Himalayan tract from the Indus to the Jhelam, Oudh, Central India, and the Deccan.

It yields an elastic gum-resin, which is procured by making incisions in the plant; this may be used as a substitute for gutta-percha. The juice is used to destroy the offensive smell of fresh leather, and it is used medicinally as an external application in the cure of certain cutaneous diseases. It was reported to yield an active principle called by **Dr. Duncan** *Mudarine,* but this has recently been shown to be incorrect. *See* **Gutta-percha.**

CAMPHOR.

76 **Camphor.**

The name "camphor" is technically given to a number of gum-resins, more or less resembling each other, derived from (1) **Cinnamomum Camphora,** *Nees.,* the well-known Camphor laurel of China and Japan; (2) **Dryobalanops Camphora,** *Colebr.,* a gigantic tree of the Malay Archipelago; (3) **Blumea balsamifera,** *DC.;* and (4) **Blumea densiflora,** *DC.,* which see.

CAOUT-CHOUC.

CANARIUM.

Canarium bengalense, *Roxb.;* BURSERACEÆ. 77

Vern.—*Goguldhúp,* NEPAL; *Narockpa,* LEPCHA; *Tekreng,* GARO; *Bisjang, dhúna,* ASS.

Eastern Himalaya, Bengal, and Burma.

It yields a brittle, amber-coloured resin, resembling copal.

C. commune, *Linn.* 78

Vern.—*Jangli badam,* HIND.

A native of the Malay Peninsula, but generally cultivated in India.

The concrete resinous exudation *Elemi* is chiefly imported from Manilla. **Ainslie** says that it has the same properties as Balsam of Copaiva.

C. strictum, *Roxb.* 79

THE BLACK DAMMAR TREE.

Vern.—*Kala dammar,* HIND., BENG., GUZ.; *Karapu kongiliam, karapu dammar,* TAM.; *Manda-dhúp,* KAN.; *Thelli,* MAL.; *Nala rojan,* TEL.

A tall tree of South India.

Yields a brilliant resin, used medicinally or as a substitute for Burgundy Pitch. This is obtained by making vertical cuts in the bark and setting fire to the tree. Two years afterwards the resin is obtained from the incisions.

There are 18 Indian members of this genus, and it is probable that all, or nearly all, yield gums, but the preceding are the gums best known.

Caoutchouc, or **India-rubber.** 80

The following are the principal Indian plants which are known to yield this most valuable substance:—

[24]—1. **Alstonia scholaris,** *R. Br.,* APOCYNACEÆ.

A common tree widely cultivated throughout the plains of India, and exceedingly useful, as it is highly ornamental.

[34]—2. **Artocarpus Chaplasha,** *Roxb.,* URTICACEÆ.

A common Burmese tree.

[87]—3. **Chonemorpha macrophylla,** *G. Don.,* APOCYNACEÆ.

Met with in East Bengal.

[81]—4. **Cryptostegia grandiflora,** *R. Br.,* ASCLEPIADACEÆ.

A common plant of West India.

[115]—5. **Ficus elastica,** *Bl.,* URTICACEÆ.

A tree very common in Assam, its western limit being Darjiling. It yields the Indian Caoutchouc or true India-rubber.

[116]—6. **F. laccifera,** *Bth.*

Yields India-rubber sparingly and of inferior quality.

[117]—7. **F. obtusifolia,** *Roxb.*

Yields an inferior rubber.

[195]—8. **Parameria glandulifera,** *Benth.*, APOCYNACEÆ.

An extensive climber on the borders of the tidal forests of Burma, extending to Malacca, Singapore, Andaman Islands, Java and Borneo.

Recently this plant has attracted considerable attention as a source of India-rubber.

[223]—9. **Urceola elastica,** *Roxb.*, APOCYNACEÆ.

Yields what is after 5 the best Indian India-rubber, and is to some extent being experimentally cultivated.

[223]—10. **U. esculenta,** *Bth.*

The same as 9, and often used indiscriminately; wild in Tenasserim.

[226]—11. **Willoughbeia edulis,** *Roxb.*, APOCYNACEÆ.

A native of Chittagong; yields fairly good Caoutchouc.

[227]—12. **W. martabanica,** *Willd.*

A native of Tenasserim.

Of the preceding, 5 is the only truly commercial product; 9 and 10 have been experimented with, and, with the others, may be utilised in future.

The following are the Caoutchouc-yielding plants from other parts of the world, well known commercially:—

1. **Castilloa elastica,** URTICACEÆ. CENTRAL AMERICAN RUBBER.
2. **Hevea,** various species, EUPHORBIACEÆ. THE PARA RUBBER.
3. **Landolphia,** various species, ASCLEPIADACEÆ. THE AFRICAN RUBBER.
4. **Manihot Glaziovii,** EUPHORBIACEÆ THE CEARA RUBBER.

A glance at these lists will show that Caoutchouc is obtained from only four natural orders,—**Euphorbiaceæ, Urticaceæ, Asclepiadaceæ,** and **Apocynaceæ,**—and the arrangement of these orders as given is that of their importance in the supply of rubber.

CARAPA.

81 **Carapa moluccensis,** *Lam.*, MELIACEÆ.

Vern.—*Poshúr, dhundhul,* BENG.; *Kandaianga,* TAM.; *Pinlé-ón,* BURM.

Coast of Bengal, Malabar, Burma, and Ceylon.

It yields a clear, brown, brittle resin.

CAREYA.

82 **Careya arborea,** *Roxb.*, MYRTACEÆ.

Vern.—*Kumbi, khumbi,* HIND.; *Gummar,* GOND; *Boktok,* LEPCHA; *Dambel,* GARO; *Kumbha,* MAR.; *Ayma, pailæpoota-tammi,* TAM.; *Budádurmi, dudippi,* TEL.; *Gavuldu,* MYSORE; *Banbwe,* BURM.

Found in the Sub-Himalayan tract, from the Jumna eastward to Bengal, and Burma, and in Central and South India.

It yields a brown gum, specimens of which, and further information, much required.

It forms with water a tolerably thick mucilage of a dark-brown colour.

CASSIA.

Cassia auriculata, *Linn.*, LEGUMINOSÆ. 83

Vern.—*Tarwar,* HIND., DEC.; *Tangedu, tangar,* TEL.; *Avarike,* KAN.

A shrub of Central and South India.

It is said in *Spons' Encyclopædia* to yield a medicinal resin, very scarce; but **Dr. Dymock** tells me he has never seen it, although he has frequently handled the bark.

C. Fistula, *Linn.* 84

THE INDIAN LABURNUM.

Syn.—CATHARTOCARPUS FISTULA, *Pers.*

Vern.—*Amaltás,* HIND.; *Sundali, bandarlati,* BENG.; *Kitwáli, kitoli, shimarra, sím, warga,* N. W. P.; *Alash, karangal, kiár, ali,* PB.; *Gurmala,* GUZ.; *Sandari,* URIYA; *Raj birij,* NEPAL; *Sonalú,* GARO; *Sunaru,* ASS.; *Bandolat,* CACHAR; *Jaggarwah, raila, karachu,* C. P.; *Báhavá,* MAR.; *Kone, sirikone, koki,* TAM.; *Reylu,* TEL.; *Ngushwe,* BURM.

Grows in Sub-Himalayan regions and throughout India and Burma.

The gum yielded is used as an astringent; said to have been contributed from Travancore to the Paris Exhibition. It exudes a red juice which hardens into gum. This gum is generally called *kamarkas;* its economic uses, if any, are at present unknown to authors on Indian economic science.

CASUARINA.

Casuarina equisetifolia, *Forester,* CASUARINACEÆ. 85

THE BEEFWOOD OF AUSTRALIA.

Vern.—*Jooreejur, mujjum,* SIND.; *Chouk,* TAM.; *Serva,* TEL.; *Kásrike,* MYSORE; *Aru,* MAL.; *Tinyu,* BURM.

Coasts of Chittagong, Burma, the Malay Archipelago, North Australia, and Queensland.

Reported to yield a good resin.

CEDRELA.

Cedrela Toona, *Roxb.*, MELIACEÆ. 86

THE TOON TREE.

Vern.—*Tún, mahanim,* HIND.; *Túni, tún,* BENG.; *Drawi,* PB.; *Maha limbu,* URIYA; *Poma,* ASS.; *Tupa, kudaka,* MAR.; *Kal kilingi,* NILGIRIS; *Tundu,* KAN.; *Thitkado,* BURM.

Grows in Sub-Himalayan forests, Bengal, Burma, South India, and Sikkim.

It yields a resinous gum, of which little is known at present.

Nees von Essenbeck has published an account of some experiments with the bark, which indicate the presence in it of a resinous astringent matter, a brown astringent gum, and a gummy brown extractive matter, resembling **Ulmina.** (*Dymock.*)

CEDRUS.

87 **Cedrus Deodara,** *Loudon,* CONIFERÆ.

DEODAR; HIMALAYAN CEDAR.

Vern.—*Diár, deodár, dadár,* KASHMIR, GARHWAL, KUMAUN; *Kelu, keoli, kilar,* HIMALAYAN NAMES; *Nakhtar,* AFG.; *Giam,* TIBET.

Grows in the North-Western Himalaya.

It yields a true resin, and, by destructive distillation, an oil, dark-coloured and resembling tar. Used medicinally. The wood is sold in the bazars for medicinal use.

88 **Cement** (EUPHORBIA CATTIMANDOO).

CHICKRASSIA.

89 **Chickrassia tabularis,** *Adr. Juss.,* MELIACEÆ.

CHITTAGONG WOOD.

Vern.—*Chikrassi,* BENG.; *Boga poma,* ASS.; *Papha,* BOM.; *Agal, aglay,* TAM.; *Madagari vembu,* TEL.; *Dalmara,* KAN.; *Arrodah,* AND.; *Yinma,* BURM.

Found in Eastern Bengal, Assam, Chittagong, Burma, and South India.

It yields a transparent, amber-coloured gum, said to have been sent from Madura to the Indian Museum in 1873. (*Spons' Enc.*)

CHLOROXYLON.

90 **Chloroxylon Swietenia,** *DC.,* MELIACEÆ.

SATIN WOOD.

Vern.—*Behra, girya, bihri,* C. P.; *Múdúdad, burús,* TAM.; *Billu,* TEL.; *Huragalu,* MYSORE; *Burute,* CINGH.

Found in Central and South India, and Ceylon.

It yields a gum and a wood-oil, specimens of which are required.

CHONEMORPHA.

91 **Chonemorpha macrophylla,** *G. Don.,* APOCYNACEÆ.

Syn.—ECHIYTES MACROPHYLLA, *Roxb.*

Vern.—*Gar bardero,* HIND.; *Yokchounrik,* LEPCHA; *Harki,* SYLHET.

A large climber with milky sap, met with in North and East Bengal and Burma.

It yields a kind of Caoutchouc, which see.

CINNAMOMUM.

92 **Cinnamomum Camphora,** *Nees,* LAURACEÆ.

One of the sources of the *Camphor* of Commerce.

Vern.—*Kafúr,* ARAB., PERS., and HIND.; *Karpúr,* BENG.; *Kapúr,* DEC.; *Karuppuram, shúdan,* TAM., TEL; *Payo parank,* BURM.

A tall tree, with smooth, shining leaves, a native of China and Japan.

Camphor is a crystalline volatile substance prepared by boiling chips of the wood in a retort. The chemical substance passes off with the steam and condenses upon straw placed in the summit of the retort for that purpose. It is afterwards purified by sublimation and made into cakes.

CITRUS.

Citrus Aurantium, *Linn.*, RUTACEÆ. 93

THE ORANGE.

Vern.—*Narangi, naringi,* HIND.; *Kamla nibu,* BENG.; *Suntala,* NEPAL; *Kitchli,* TAM.; *Kittali,* TEL.

Cultivated in many parts of India, but to a large extent in Sikkim and Sylhet.

Supposed to yield a gum: the yield is very scanty and of no importance. Sent from Masulipatam to be exhibited in Madras in 1855.

C. decumana, *Willd.* 94

THE SHADDOCK OR PUMELO.

Vern.—*Mahá nibu, chakotra,* HIND.; *Bátávi nebu,* BENG.; *Papanasa,* BOM.; *Shouk-ton-oh,* BURM.

Introduced into India from Java; cultivated in most tropical countries.

Said to yield scantily an unimportant gum. Exhibited in 1855 in Madras.

C. medica, *Linn.* 95

THE CITRON; LEMON.

Vern.—*Bijaura, Bara nimbu,* HIND.; *Begpura, korna nebu, lebu, nebu,* BENG.; *Jambira,* SANS.; *Bijapúra,* BOM.

Wild in Burma, Chittagong, "Sitakund Hill," Khásia, foot of the Himalaya, ascending to 4,000 feet; in the hot valleys of Sikkim, ascending to 4,000 feet.

Said to yield scantily an unimportant gum. Sent from Masulipatam to the Madras Exhibition in 1855.

COCCOS.

Coccos nucifera, *Linn.*, PALMÆ. 96

THE COCOA-NUT PALM.

Vern.—*Narel,* HIND.; *Narikel,* BENG.; *Tenna, tenga,* TAM.; *Narikadam,* TEL.; *Pol,* CINGH.; *Ong,* BURM.

The stem of this well-known tree is in Tahiti said to yield gum. It forms large stalactitic masses, red-brown, translucent or transparent. (*Spons' Encycl.*) It would be exceedingly interesting to learn if this gum is known to the natives of India.

COCHLOSPERMUM.

Cochlospermum Gossypium, *DC.*, BIXINEÆ. 97

Vern.—*Kúmbi, gabdi, galgal,* HIND.; (the gum) *Kathalya gond,* BOM.; *Gúngú,* TEL.; *Tanaku,* TAM.

Grows in forests at the base of the North-Western Himalaya, from the Sutlej eastward, in Central India, Deccan, and Prome district, Burma; commonly planted near temples.

It yields a clear white gum (*Katira*), which, according to **Baden-Powell**, is used in shoe-making. It may be used as a substitute for gum tragacanth. There is very little demand for gums of these classes.

CONVOLVULUS.

98 **Convolvulus Scammonia,** *Linn.*, CONVOLVULACEÆ.

SCAMMONY.

Vern.—*Sák muniya,* HIND.

A gum-resin imported through Bombay from Europe by European druggists. It is obtained by incision from the living root. It occurs in irregular pieces of an ash-grey colour and rough exterior. When broken, it presents a resinous surface, and of a shining black colour when dry. It has a cheesy odour and flavour. The bazar *Scammony* in Bombay, **Dr. Dymock** tells me, is all false, and is made at Surat.

99 **Copal Gum,** or **Gum Animi.**

A hard, transparent substance, resembling Amber, found as a natural exudation from certain trees. This substance is chiefly obtained from Zanzibar, the produce of **Trachilobium Hornemannianum,** *Hoyne,* LEGUMINOSÆ. It is yielded by the trees at the present day, but the commercial substance may be said to be a half-petrified condition. This is known as Fossil Copal, and is regarded commercially as much superior to that obtained from living trees. It occurs in immense masses, found buried in the sand, far away from any living trees, and chiefly in the coast sands. There are other Copals sometimes met with. Brazilian Copal is obtained from **Hymenæa Courbaril.** Madagascar Copal from **Trachylobium verrucosa.** West African Copal is furnished by **Guibourtia Copalifera,** and Indian Copal from **Vateria indica,** which see. The Australian and New Zealand Copal is the produce of **Dainmara australis (Coniferæ).** It forms large solid masses, often found in places where the trees are not now found, and in New Zealand is known as *Kawri.* There is a specimen in the Bengal Economic Museum of this gum.

CORDIA.

100 **Cordia Rothii,** *Röm. & Sch.*, BORAGINEÆ.

Vern.—*Gondi, gondni,* HIND.; *Liár,* SIND; *Gondani,* MAR.; *Narvilli,* TAM.

Grows in the dry zones of North-West and South India.

The bark, when wounded, yields a gum, prepared at Coimbatore.

CRYPTOSTEGIA.

101 **Cryptostegia grandiflora,** *R. Br.*, ASCLEPIADACEÆ.

A common plant of West India, said to yield an inferior quality of Caoutchouc.

CUPRESSUS.

102 **Cupressus torulosa,** *Don.*, CONIFERÆ.

HIMALAYAN CYPRESS.

Vern.—*Devi-diár,* RAVI; *Gulla,* SIMLA; *Sarrú,* TIBET.

The wood yields a resin, and is often burnt as incense.

CYCAS.

Cycas Rumphii, *Miq.*, CYCADACEÆ. 103

Vern.—*Mondaing,* BURM.

An evergreen palm-like tree frequent in the beach forests of the sea-coast of South Tenasserim and the Andamans.

Exudes a good sort of resin used medicinally. (*Kurz.*)

C. siamensis, *Miq.* 104

An evergreen, low, stemless, palm-like tree frequent in the Eng and dry forests of the Prome district.

Exudes a peculiar whitish gum like tragacanth. (*Kurz.*)

DALBERGIA.

Dalbergia cultrata, *Grah.* 105

Vern.—*Yindaik,* BURM.

A tree of Burma.

Exudes a red resin. (*Kurz.*)

D. paniculata, *Roxb.*, LEGUMINOSÆ. 106

Vern.—*Dhobein,* HIND.; *Katsirsa,* OUDH; *Pási* or *phasi,* MAR.; *Patchalai,* TAM.; *Potrum,* TEL.; *Tapoukben,* BURM.

Grows in the North-Western Himalaya, from the Jumna to Oudh, Central and South India.

The tree yields a gum.

Dammar Gum. 107

A name given to a group of gums of which the most characteristic may be said to be **Dammara orientalis,** a native of the Moluccas; **D. Australis,** a native of New Zealand; Indian Dammar is the commercial name for the gum of **Shorea robusta** (which see); Black Dammar is the gum of **Canarium strictum** (which see), and also of *Poon-yet* (which see), and Rock Dammar is the commercial name for the gum of **Hopea odorota** (which see).

DAMMARA.

Dammara alba, *Rumph.*, CONIFERÆ. 108

It is met with in the Moluccas.

Yields the resin called *Dammar,* which should be distinguished from *Kala Dammar* or *Poon-yet.* There are various species belonging to this genus, which yield the true Commercial Dammar, but none are natives of India.

Dextrine. 109

A chemical substance present in most grains, having the formula $C_{12}H_{10}O_{10}$. Wheat contains 4·5; wheat-bran, 5·52; barley, 6·55; rye-bran, 7·79; malt, 8·23. In commerce the term is applied to the substance artificially produced by the transformation of starch. It is largely used in calico-printing, paper-glazing, gumming envelopes and postage stamps.

DICHOPSIS.

110 **Dichopsis elliptica,** *Benth.*, SAPOTACEÆ.

Syn.—BASSIA ELLIPTICA, *Dalz.*; ISONANDRA ACUMINATA. (*Drury's Useful Plants.*)

Vern.—*Paunchoti pala,* TAM.; *Panchonta,* KAN.

A large tree of the Western Ghâts, extending from Bombay to Kanara, and ascending to an altitude of 4,000 feet.

This is the tree which yields the Indian Gutta-percha, a substance which has attained a certain amount of popularity as an adulterant for Singapore Gutta. It is stated that as much as 20 to 30 per cent. may be used without its characteristic properties being destroyed. To **General Cullen** must be attributed the honour of having brought this substance prominently before the public, recommending, amongst many other uses, its adaptability as a cement. **Balfour** describes the gum as obtained by tapping the trees—a process quite different from that resorted to in the Malay Peninsula.

111 **D. Gutta,** *Bth. & Hook.f.*

Indigenous in Singapore and the Malay Archipelago. It formerly existed in abundance in the southern part of the Malay Peninsula; it extends to Sumatra, Borneo, and probably the other islands of the Malay Archipelago. (*Kew Report, 1881.*)

Yields the "Gutta-percha" of commerce, exported to Europe from Singapore and the Malay Archipelago. *See* **Gutta-percha.**

112 **D. obovata,** *Clarke.*

Syn.—ISONANDRA OBOVATA, *Griff.*

An evergreen tree extending from Tenasserim to Malacca and Penang.

Kurz says it yields a fair sort of Gutta-percha.

113 **D. polyantha,** *Benth.*

Syn.—ISONANDRA POLYANTHA, *Kurz.*

Vern.—*Tali,* BENG.; *Sill-kurta,* CACHAR.

A tree 30 to 40 feet in height, occurring in Sylhet, Chittagong, and Pegu.

Kurz says it produces a good quality of Gutta-percha in large quantities, probably not inferior to that of Singapore. The flowers are eaten. (*Keenan.*)

DICHROSTACHYS.

114 **Dichrostachys cinerea,** *W. & A.*, LEGUMINOSÆ.

Vern.—*Vurtuli,* HIND.; *Vadatalla,* TAM.; *Velturn,* TEL.; *Andara,* CINGH.

Grows on dry, stony hills in South and Central India, and in Rajputana.

DIOSPYROS.

115 **Diospyros Embryopteris,** *Pers.*, EBENACEÆ.

Vern.—*Gáb, makur-kendi,* BENG., HIND.; *Kendu,* ASS.; *Temburni,* MAR.; *Tumbika,* TAM.; *Tumil, tumika,* TEL.; *Timberee,* CINGH.

Found throughout India and Burma, except the arid and dry zones in the Punjab and Sind.

The fruit yields a gum, used in book-binding, and as a substitute for tar to make boats water-proof. It is a dark-brown, rather earthy-looking resin, with a bright fracture. It should be determined whether the resin can be obtained from the bark of the tree as well as from the rind of the fruit.

"The extract of the fruit is of the colour and consistence of shell-lac." (*Dymock.*)

Diospyros melanoxylon, *Roxb.* 116

Vern.—*Tendu, kendu,* HIND.; *Kend,* BENG.; *Tumbi,* TAM.; *Tumi,* TEL.; *Balai,* KAN.

Found throughout India, but not in Burma.

DIPTEROCARPUS.

Dipterocarpus alatus, *Roxb.,* DIPTEROCARPEÆ. 117

Vern.—*Garjan,* BENG.; *Kanyin,* BURM.

Chittagong, Burma, and Andaman Islands.
It yields a wood-oil and a dirty-brown resin.

D. incanus, *Roxb.* 118

Chittagong.
It yields a wood-oil or balsam.

D. lævis, *Ham.* 119

Syn.—Placed under D. TURBINATUS, *Gaertn., in Fl. Br. Ind.*

Vern.—*Kanyin,* BURM.

Found in the tropical forests throughout Burma.
It yields a resin and a large quantity of wood-oil.

D. tuberculatus, *Roxb.* 120

THE ENG.

Vern.—*In,* BURM.; *Sooahn,* TALEING.

Chittagong and Burma.
It yields no wood-oil, but exudes a clear yellow resin. (*Kurz.*)

D. turbinatus, *Gaertn. f.* 121

THE GARJAN-OIL TREE.

Syn.—D. LÆVIS, *Ham., in part as in Fl. Br. Ind.*

Vern.—*Garjan,* BENG.; *Kanyinni,* BURM.

Found in Eastern Bengal, Chittagong, Burma, and the Andaman Islands.
It yields a wood-oil or balsam used in painting houses and ships.

D. zeylanicus, *Thwaites.* 122

Vern.—*Horá,* CINGH.

A large tree met with in Ceylon up to altitude 3,000 feet. It gives a wood-oil and gum-resin. (*Gamble.*)

DOONA.

123 **Doona zeylanica,** *Thwaites*, DIPTEROCARPEÆ.

Vern.—*Doon*, CINGH.

Central provinces of Ceylon.

It yields a large quantity of colourless gum-resin, which, dissolved in spirits of wine or turpentine, makes an excellent varnish. Specimens of this gum, as well as of the varnish, much required; also further information.

DOREMA.

124 **Dorema ammoniacum,** *Don.*, UMBELLIFERÆ.

Vern.—*Ushak*, PERS.

A native of Persia, particularly of the provinces of Farsistan, Irak, and Khorasan.

This plant yields (a part at any rate of) the gum-resin imported into India under the name of **Ammoniacum.** It is used as a stimulant, and a mild expectorant; also externally. It occurs in tears and masses, the tears being from two to eight lines in diameter, of a pale, cinnamon-brown colour, breaking into an opaque, shining, white surface, with faint odour, and bitter, nauseous taste. It forms a milky solution when mixed with water. It easily softens with heat, and burns with a disagreeable, pungent odour.

"The roots (*Boi*) are imported into Bombay and are used as incense by the Parsís. They are the false or Indian *Sumbal* of European commerce." (*Dymock.*)

DRYOBALANOPS.

125 **Dryobalanops Camphora,** *Colebr.*, DIPTEROCARPEÆ.

BARAS CAMPHOR.

Vern.—***Bhimseni-kapur***, BOM.

A tree of Sumatra.

Yields Borneo camphor.

An oil also exudes through its fissures and cavities, and is carefully collected. **Dr. Dymock** informs me that camphor is used as incense by the Jains in Bombay.

DYERA.

126 **Dyera costulata**, *Hook. f.*, APOCYNACEÆ.

127 **D. lasiflora,** *Hook. f.*

Sir J. D. Hooker, in the *Linnæan Society's Journal, Vol. XIX, p. 293*, gives a brief history of these plants, while founding the new genus to which they are referred, a genus named in honour of **Professor Dyer,** the Assistant Director of the Royal Botanic Gardens, Kew.

D. costulata was first collected by **Griffith** in Malacca, and has since been re-collected both in Malacca and in Sumatra. **D. lasiflora** seems confined to Singapore.

These interesting trees have been shown to be the source of the *gutta-jelutong* of commerce.

ELÆAGNUS.

128 **Elæagnus hortensis,** *M. Bieb.*, ELÆAGNEÆ.

Vern.—*Shiúlik*, N. W. P.; *Santij*, AFG.; *Sirshing*, TIBET.

A small tree of Ladák, Baltistan, and Afghanistan.

The fruit is eaten and a spirit distilled from it in Yarkand. It yields a transparent gum.

ELÆODENDRON.

129 **Elæodendron glaucum,** *Pers.*, CELASTRINEÆ.

Syn.—E. ROXBURGHII, *W. & A.*; E. PANICULATUM, *W. & A.*; NEERIJA DICHOTOMA, *Roxb. in Fl. Ind.*

Vern.—*Mirandu, janwa*, PB.; *Bakra, shaunriya, chauli, daberi, mámri*, N. W. P.; *Bhutápálá*, MAR.; *Karkava*, TAM.; *Nirija*, TEL.; *Nerrelu*, CINGH.

Grows in the Sub-Himalayan tract, from the Ravi eastward, Central and South India.

It is supposed to yield the gum called *Jumrasi*. It occurs in roundish tears about ½ inch in diameter, rough or cracked on the surface. Tasteless, forming a sherry-coloured solution.

130 **Elemi Gum.**

There is considerable doubt as to the plant or plants from which this substance is obtained. It seems to be a member of the **Burseraceæ.** It is generally supposed to be a species of **Icica** or of **Amyris** or of **Canarium.** (It should not be confounded with *Animi*, for which see **Copal.**)

ERIODENDRON.

131 **Eriodendron anfractuosum,** *DC.*, MALVACEÆ.

Syn.—BOMBAX PENTANDRUM, *Roxb.*

Vern.—*Hatian, senibal, kuntan*, HIND.; *Shwet-simúl*, BENG.; *Saphetasavara*, MAR.; *Elavamaram*, TAM.; *Pur*, TEL.

A large tree, common on the Coromandel Coast.

It yields a black and opaque gum, known as *Hatian-ke-gond*, sent from Madras to the Punjab Exhibition.

ERYTHRINA.

132 **Erythrina indica,** *Lam.*, LEGUMINOSÆ.

THE INDIAN CORAL TREE.

Vern.—*Pangra, panjira*, HIND.; *Palita mandar*, BENG.; *Pángárá*, MAR.; *Muruká*, TAM.; *Modugu*, TEL.; *Pinlékathit*, BURM.

Cultivated throughout India and Burma; wild in Oudh, Bengal, South India, and Burma.

It yields a dark-brown gum of little importance.

EUCALYPTUS.

133 **Eucalyptus Globulus,** *Labill.*, MYRTACEÆ.

Vern.—*Kurpoora maram*, TAM.

The blue gum tree of Tasmania; introduced into India and cultivated in Madras, especially on the Nilgiris.

EUGENIA.

134 **Eugenia caryophyllæa,** *Wight,* and **E. Jambolana,** *Lam.,* MYRTACEÆ.

Vern.—*Jáman,* HIND.; *Jám,* BENG.

Both are said to yield a gum, somewhat resembling *Kino.*

EUPHORBIA.

135 **Euphorbia antiquorum,** *Linn.,* EUPHORBIACEÆ.

Vern.—*Tidhara,* HIND.; *Tekata sij,* BENG.; *Shidu,* MECHI; *Dalúk,* CINGH.; *Shasaungpyathat,* BURM.

A bush with three-angled branches and stems, found on the arid hills above Coimbatore, and on the lower dry slopes of the Himalaya from Kashmir eastward.

It yields a milky juice, used as a medicine, and regarded as a powerful cathartic. This is the resinous substance known in Europe as **Euphorbium**; it is prepared by boiling down the fresh milky juice. The true or original **Euphorbium** is the gum of **E. resinifera,** supplied to Europe from Morocco and Barbary. It is chiefly used in the preparation of the anti-corrosive paint used for the bottom of ships. It closely resembles gutta-percha; it is partially soluble in oil, and may be applied to steam joints instead of red-lead. The gutta-percha-like substance has been called *Catimando* (*Baden-Powell*). This gummy substance is the *Doof* of the Hindus, a much-prized medicine.

136 **E. Cattimandoo,** *Elliot.*

Vern.—*Katti mandu,* TEL.

A small tree with five-angled stems.

The milk yields the true *Cattimandu* used as a cement; common in Vizagapatam district. This contains sufficient caoutchouc to make it a profitable enough source of supply.

"Fluckiger has obtained from this plant, as also from **E. Tirucalli,** EUPHORBON, the active principle of the officinal **Euphorbium,** and it is probable that most of the Indian species will yield a gum of the same properties as commercial **Euphorbium.**" (*Dr. Dymock.*)

137 **E. neriifolia,** *Linn.*

Syn.—E. LIGULLARIA, *Roxb.*

Vern.—*Mansa sij,* BENG.; *Gangichu,* PB.; *Nivadunga, mingut,* MAR.; *Thohur,* SIND; *Shasaung,* BURM.

A small tree with spirally twisted stem, cultivated near villages throughout India, and in some parts of the country regarded as sacred.

The milk is used in native medicine like the preceding; it yields a gum or gutta-percha-like substance on boiling.

138 **E. pulcherrima,** *Willd.*

Syn.—POINSETTIA PULCHERRIMA, *Grahm.*

Cultivated in gardens on account of its crimson floral leaves, which appear about Christmas.

It yields freely a milky sap, which hardens into a black gum, or may be boiled down to a sort of gutta-percha.

Specimens of the gums, gutta-perchas, or caoutchoucs of the Indian **Euphorbias** are much required, as also information as to their preparation and uses.

Euphorbia resinifera. *See* No. 113, *and under* **Gutta-percha.**

E. Tirucalli, *Linn.* 139

Vern.—*Sehund,* HIND.; *Lanka sij,* BENG.; *Tiru kalli,* MAL.; *Sha-soung leknyo,* BURM.

A small tree without round stem. The wood is strong and used for veneering and toys. The milk is acrid; twigs thrown into water intoxicate fish. **Dr. Riddell,** writing of this plant, says the milk when it "hardens after boiling becomes brittle; whilst warm it is as ductile" as mudar gutta-percha. The juice is, however, very difficult to deal with, as it causes excruciating pain if it gets into a cut in the skin or into the eye. On this account it is said to be used criminally to destroy the eyes of certain domesticated animals.

EXCÆCARIA.

Excæcaria Agallocha, *Willd.,* EUPHORBIACEÆ. 140

Vern.—*Gangwa, geor, goria,* BENG.; *Tayan, ka-yan,* BURM.

A small evergreen tree of the tidal-shores of Bengal, Burma, and the Andaman Islands.

Wood contains a poisonous sap, which causes the eyes of men engaged in hewing down the trees to become swollen. It hardens into a black caoutchouc-like substance.

FERONIA.

Feronia Elephantum, *Correa,* RUTACEÆ. 141

THE WOOD-APPLE.

Vern.—*Bilin, kat-bel,* HIND.; *Kath-bel,* BENG.; *Kavatha,* MAR.; *Katoree,* SIND; *Vallanga,* TAM.; *Velagá,* TEL.; *Hman, ma-han,* BURM.

Found in the Sub-Himalayan forests from the Ravi eastward, in Bengal, South India, and the Chanda district of the Central Provinces.

It yields a brownish or reddish, with a small proportion of clear yellow, gum soluble in water; said to have been sent from Madras to the Punjab Exhibition. **Ainslie** says that it is used by dyers and painters, particularly miniature and chintz painters. It is also employed in making ink and varnish, and by brick-layers in preparing certain cements and plasters. It occurs in irregular tears, semi-transparent or brownish. The *Pharmacopœia of India* pronounces it as superior to gum-arabic for medicinal purposes.

"It forms a stronger mucilage than gum-arabic, but is not identical with it. It is precipitated by acetate of lead." (*Dymock.*)

FERULA.

Ferula alliacea, *Boiss.,* UMBELLIFERÆ. 142

Syn.—F. ? PERSICA, *Willd.*

Vern.—*Hing,* BOM. and HIND.; *Hingu,* SANS.; *Anjudán,* KASHMIR; *Kyam, perungayam,* TAM. The names of this plant are used also for any of the following Asafœtida-yielding species.

Dymock, in his *Mat. Med. of Western India,* reports that this plant supplies the Asafœtida which is most used by the natives of India, and in which a large trade is done in Bombay. It is a solid brown gum, contained in skins mixed with impurities and certain portions of the plant.

The thick, fleshy roots of the Asafœtida-yielding plants are cut or scratched, when a milky juice exudes. This hardening forms the fœtidly-scented gum-resin. By Eastern doctors this has, from the remotest times, been held in great esteem, and was once regarded as worth its weight in silver. In England its use as a medicine has of late years greatly diminished, although it is still much used in other countries of Europe.

143 **Ferula Galbaniflua,** *Boiss.*

GALBANUM (which see).

Vern.—*Jawashir, khassuch, gaoshir, birees,* PERS.

The names *Barsad, kuineh,* ARAB., and *Bireja* or *Ganda-birosa,* HIND., are sometimes applied to this gum, but more frequently to the gum of **Cedrus Deodara.**

A native of Persia from which the gum is imported into Bombay and re-exported to Egypt and Turkey as *Jawashir.* It is not used in India.

The *Jawashir,* as met with in India, is not dry agglutinated tears, but is a yellow or greenish fluid, generally mixed with stems, flowers, and fruits of the plant. It has an odour between that of Levant Galbanum and Sagapenum.

The ancient Hindu physicians were unacquainted with this substance, and the names more recently given for it are those referred to above as the vernaculars for Cedar gum. It seems quite clear that the Persian *Jawashir* was not identified with the Galbanum of the Greeks, although in Mahomedan works on medicine, Galbanum is by name repeatedly referred, the synonyms used being *Barsad* and *Kinneh.* This may be accounted for by the fact that in olden days the Persian Jawashir may not have been imported into Bombay. Our steam-ships have, in many other instances, destroyed old-established routes of exportation, and, deflecting them into new and more convenient channels, have produced many curious instances of importation and re-exportation. (*Dymock; Pharmacographia, &c.*)

144 **F. Jaeschkiana,** *Vatke.*

The *Flora of British India* remarks on this species: "**Regel Schmalh** thinks that this plant probably produces the Asafœtida of commerce; this may be so, as it is an abundant species in Kashmir and very abundantly supplied with oil; but it is not the Asafœtida of Linnæus." It is probable that the gum-resin referred to as **F. Narthex** in India may be largely the produce of this species.

Yields a gum-resin, which, **Aitchison** says, is applied to wounds and bruises by the inhabitants of Kurum valley.

145 **F. Narthex,** *Boiss., Fl. Orient.*

Generally supposed to be the ASAFŒTIDA of Commerce.

Syn.—NARTHEX ASAFŒTIDA, *Falc. in Trans. Linn. Soc. XX, 285.*

Vern.—*Hingra,* BOM.; *Anghuseh-i-lari,* PERS.

Afghanistan, also imported into India from Persia.

The *Flora of British India,* speaking of this species, remarks: "This is certainly not **Ferula Asafœtida,** *Boiss., l. c.,* which is **Scorodosma fœtidum,** *Bunge.* Whether it is **F. Asafœtida,** *Linn.,* is a doubtful point." **Dr. Dymock** tells me that from specimens received he believes **Scorodosma fœtidum,** *Bunge,* to be the source of Afghan Asafœtida. **Scorodosma fœtidum** is said to yield the Caspian Asafœtida. Indian Asafœtida or *hingra* is chiefly imported from Afghanistan. While it seems doubtful as to the actual source of this substance, the true Asafœtida of Europe, it is probable the natives of India would not regard it as such; the gum-resin of **F. alliacea** is held in much greater esteem.

The gum-resin occurs in irregular masses, opaque, white when broken, and ultimately becoming brownish-pink. Sometimes met with in India in the form of a ferruginous powder.

It occurs also in tears, or flat pieces, or "stone" formed by mixing with sand. It is recognised by its bitter, acrid taste, and by its fœtid odour. It is used in medicine.

FICUS.

Ficus bengalensis, *Linn.*, URTICACEÆ. 146

THE BANYAN TREE.

Syn.—F. INDICA, *Roxb.*

Vern.—*Bor, bar, ber, bargat,* HIND.; *Bur, but,* BENG.; *Borar,* NEPAL; *Kangji,* LEPCHA; *Banket,* GARO; *Bot,* ASS.; *Boru,* URIYA; *Ala,* TAM.; *Mári, peddi-mari,* TEL.; *Ahlada,* KAN.; *War, vada,* MAR.; *Panyaung,* BURM.

A large tree, wild in the East Himalayan tracts, planted throughout India.

It yields an inferior caoutchouc; by the natives made into bird-lime.

F. elastica, *Bl.* 147

THE INDIA-RUBBER TREE.

Vern.—*Bar, attah bar,* BENG., ASS.; *Kagiri,* KHASIA; *Lesu,* NEPAL; *Nyaungbawdi,* BURM.

North-Eastern Himalayas, eastward to Assam, and Arracan. Government has a large plantation of it in Assam.

The tree yields the India-rubber of Indian commerce. *See* **Caoutchouc.**

F. laccifera, *Roxb.* 148

Vern.—*Yokdúng,* LEPCHA; *Prab, phegran,* GARO; *Bur,* ASS.; *Nyaunggyat,* BURM.

An epiphytic tree of North-East Himalaya, East Bengal, Burma, and South India.

It yields an inferior form of caoutchouc. (*Gamble.*)

F. obtusifolia, *Roxb.* 149

Vern.—*Krapchi,* MECHI; *Date,* MAGH.; *Nyoung-kyap,* BURM.

A small-leaved, epiphytic tree of North and East Bengal and Burma. Yields a good form of caoutchouc. (*Gamble.*)

F. religiosa, *Linn.* 150

THE PEEPUL.

Vern.—*Pipal,* HIND.; *Aswat,* BENG.; *Arasa,* TAM.; *Rái,* TEL.

Wild in the Sub-Himalayan tract, Bengal, and Central India.

The bark yields a tenacious milky juice, which hardens into a substance resembling Gutta-percha. (*Gamble.*)

Frankincense. *See* **Boswellia floribunda.**

GARCINIA.

[135] **Galbanum** of the Greeks.

A gum obtained from Persia, sparingly met with in Upper India. Considerable doubt still exists as to the plant or plants from which this substance is derived, but it is generally supposed to be from **Ferula Galbaniflua**, the *Khassuch* of the Persians, and from **F. rubricaulis.** The former is said to be gathered by the inhabitantsof the district of Demavend, and the latter by the inhabitants of Hamadan. Dymock adds, however, further information on this point. He says: "Persian brokers in Bombay state that the Galbanum plant is very abundant between Shiraz and Kirman, and there would seem to be no reason to doubt that this market (Bombay) is supplied from that district."

"The Galbanum of European commerce is an entirely different drug, and is known as Levant Galbanum." (*Dymock.*)

[151-162] **Gamboge.** *See the various species of* **Garcinia,** GUTTIFERÆ.

GARCINIA.

151 **Garcinia Cambogia,** *Desrouss.*, GUTTIFERÆ.

Vern.—*Aradal,* KAN.; *Heela,* BURGHERS (*Nilgiri Hills*).

West Coast and Ceylon.

This tree yields a yellow gum, insoluble in water, but soluble in spirits. It is, therefore, likely to prove useful as a varnish, but not as a pigment.

152 **G. cornea,** *Linn.*

East Bengal and Burma.

It yields an inferior kind of Gamboge.

153 **G. Cowa,** *Roxb.*

Vern.—*Cowa,* HIND.; *Taungthalé,* BURM.

East Bengal, Assam, Chittagong, Burma, and the Andaman Islands.

It is said to yield a kind of Gamboge of a somewhat paler colour than that produced by **G. Morella.** (*Gamble.*)

154 **G. eugeniæfolia,** *Wall.*

Eastern Peninsula, Singapore, Malacca. (*Griffith.*)

Helfer says that the stem exudes a green varnish; and, Griffith, that the juice of the fruit is milky.

155 **G. heterandra,** *Wall.*

Vern.—*Thanat-taw,* BURM.

Hills of Burma up to 3,000 feet.

It yields a superior kind of Gamboge. (*Kurz.*)

156 **G. loniceroides,** *T. And.*

Swamp forests in Pegu.

It yields a small quantity of inferior Gamboge.

157 **G. Mangostana,** *Linn.*

THE MANGOSTEEN.

A specimen of this gum was sent to the London Exhibition of 1862 from *Malacca.* O'Shaughnessy says that the gum is obtained from the rind as well as from the bark. The rind is a popular remedy for diarrhœa and dysentery.

Garcinia Morella, *Desrouss.* 158

THE GAMBOGE TREE.

Syn.—G. PICTORIA, *Bedd.*, the form met with on the Malabar and Canara, Mysore and the Western Coast.

Vern.—*Aradal, punarú puli,* KAN.; *Gokatú,* CINGH.; *Makki,* TAM.

Forests of the Khásia Hills, East Bengal, and the west coast of Ceylon.

The tree produces the true Gamboge, which is used in medicine, and in the arts as a paint. The chief trade supply is obtained from Siam in the form of cylindrical pieces or sticks into which it has been melted. In Ceylon, **Gamble** says, it is collected by cutting off thin slices of the bark, about the size of the hand. Upon the exposed surface the gum collects, and is scraped off when sufficiently dried. **Dymock** says: "There would seem to be no doubt the Gamboge has never been collected in India as an article of commerce, and that it is only from a comparatively recent date that the drug has been known in this country. The *Ussárah-i-Rewand* of Arabic and Persian books is, probably speaking, an extract of Rhubarb." The name has now been given to Gamboge also.

G. stipulata, *T. And.* 159

Vern.—*Sana-kadan,* LEPCHA.

Sikkim and Bhutan, up to 4,000 feet.

The tree and fruit yield a yellow gum, which does not seem to be used. (*Gamble.*)

G. travancorica, *Beddome.* 160

Vern.—*Malampongu,* TINNEVELLY.

Forests of Travancore and Tinnevelly.

Every portion of the tree yields an abundance of bright yellow Gamboge. (*Beddome.*)

G. Wightii, *T. And.* 161

South India.

The Gamboge of this species is very soluble and yields a good pigment. (*Dr. T. Anderson.*)

G. xanthochymus, *Hook. f.* 162

Syn.—XANTHOCHYMUS PICTORIUS, *Roxb.*

Vern.—*Dampel,* HIND.; *Tepor,* ASS.; *Jhárámbi,* MAHR.; *Mataw,* BURM.

East Himalaya, East Bengal, Burma, South India.

"It yields a large quantity of indifferent Gamboge." (*Roxburgh.*)

GARDENIA.

Gardenia coronaria, *Ham.* 163

Vern.—*Yeng-khat,* BURM.

A tree met with all over Burma from Chittagong, Pegu, and Martaban down to Tenasserim.

Yields a yellow wax.

164 **Gardenia gummifera,** *Linn. f.*, RUBIACEÆ.

Vern.—*Dékámáli, kamarri,* HIND., GUZ.; *Chitta matta, gaggaru,* TEL.; *Chitta, kambi,* KAN.

A large shrub of Central and South India.

It yields a yellow gum-resin. Ainslie calls this *Chumbipisim.* The resin occurs in the form of earthy-looking masses of a dull olive-green colour. The odour is peculiar and offensive.

165 **G. lucida,** *Roxb.*

Vern.—*Dikámáli,* HIND., GUZ.; *Kumbi,* TAM.; *Karinga,* TEL.

Found in Central and South India, and Chittagong.

The gum is hard, opaque, yellow, greenish or brown, with a strong smell, and is used in the treatment of cutaneous disease, and to keep off flies and worms. (*Gamble.*)

166 **G. obtusifolia,** *Roxb.*

Vern.—*Yingat,* BURM.

A small, deciduous tree of Burma.

It yields a yellow, pellucid resin.

GARUGA.

167 **Garuga pinnata,** *Roxb.*, BURSERACEÆ.

Vern.—*Ghogar,* HIND.; *Júm,* BENG.; *Kharpat,* PB.; *Koorák,* BOM.; *Karre vembu,* TAM.; *Chinyóp,* BURM.

Grows in the Sub-Himalayan forest from the Jumna eastward, Central and South India, Chittagong, and Burma.

The clear, greenish-yellow exudation of this tree, called *curvambu* (exhibited in Madras in 1855), contains a small proportion of resin and some oil; it has a terebinthiaceous odour and taste.

168 **Gluta travancorica,** *Beddome,* ANACARDIACEÆ.

GOSSYPIUM.

169 **Gossypium herbaceum,** *Linn.*, MALVACEÆ.

THE COMMON INDIAN COTTON.

A small specimen was exhibited in Madras in 1855.

This may be a mistake for **G. arboreum,** if not for **Bombax malabaricum.**

Additional information and specimens would be very interesting.

GREVILLEA.

170 **Grevillea robusta,** *Kunn.*, PROTEACEÆ.

THE SILK OAK.

A native of Australia; grows well in India; a fine avenue may be seen in the Calcutta Botanic Gardens running toward the great Banyan tree.

Yields a gum, like **Moringa,** of a vinous-red colour.

171 **Gurjun.**

BALSAM OR WOOD-OIL.

This valuable substance is the produce of several Burmese trees, of which **Dipterocarpus lævis** and **D. turbinatus** are the most important, which see.

GUTTA-PERCHA.

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GUTTA-PERCHA.

Gutta-percha.

A commercial term for the inspissated milky sap of several plants, of which nearly all (or at least all the important ones) belong to the natural order **Sapotaceæ.** The word gutta-percha is of Malayan origin; it signifies the gum or *gutta* of the tree known as *percha.* The gutta-percha of commerce is, however, chiefly the *gutta-taban* or **Dichopsis Gutta**, a tree of Perak. As it reaches the market, however, this is largely adulterated, often consisting of the inspissated saps of some five or six different plants mixed together, of which a fig and bread fruit tree, yielding inferior India-rubber, are most probably the largest adulterants. Gutta-percha seems to have come into the notice of Europe in the year 1845 (from the Straits), its important uses soon causing an immense demand. It is principally used in coating telegraphic cables, it being a perfect insulator, while of such a nature as to withstand, in a remarkable degree, the action of water. It is in fact much more durable when entirely submerged than when exposed to a moist atmosphere. About 10 years have been stated to be the period it will withstand the variations of climate in the air; 20 years if enclosed in iron tubes; but 20 years, when it has been submerged, have no appreciable effect upon the article. This is due to the fact that under the influence of light and air it slowly becomes oxidised, being converted into a brittle resin soluble in hot alcohol. This is the great defect of Gutta-percha, for, when oxidised, it loses its plastic nature. Under water and at great depths in the sea, it is, however, very durable, hence its value as an insulator for submarine cables. Chemically, gutta-percha is almost identical with India-rubber, but it differs physically, being tough and inelastic.

Since the date Gutta-percha was made known to Europe, perhaps no substance has developed more rapidly, and, with India-rubber, its uses may be said to be so many and so important as to make it perfectly indispensable to commerce.

The immense demand has caused an extended enquiry all over the globe with the view of expanding the field of supply or discovering substitutes in sufficient abundance likely to meet the demand without endangering the extermination of the supply of plants. As far as Gutta-percha is at present concerned, there cannot be a doubt but that a few years more will suffice to eradicate the supply from the Straits Settlements. This prospect is an alarming one, and one in which not only the Colonial Government should take the most decided steps within its power, but one which should excite a reaction in India. There does not seem to be the slightest reason why our tidal forests should not, to a large extent, be made to meet the demand. There cannot be a doubt but that the true Gutta-percha plant would thrive in many of our almost wasted forest tracts were it to be experimentally introduced.

Dr. Dennys, in a report submitted to the Straits Government, urges the absolute necessity of Government taking over the responsibility of preserving and renovating the Gutta-percha forests. He calculates that by planting the waste lands in Singapore, in about 20 years 100,000 trees of the true Gutta-percha plant would yield $450,000. There seems every reason to hope that if simply planted with other trees in our sub-tropical forests on the low hills near the sea an enormous revenue might in the future be obtained without any cost of cultivation whatever more than the mere ordinary conservancy charges which are being incurred in any case. The question of Gutta-percha supply is quite independent from that of India-rubber. When about 20 years old the trees are cut down and ringed in spaces a foot wide and 15 to 18 inches apart. The upper end of the tree is cut off, as this is said to cause bleeding more freely. Buckets

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are placed below the ringed portions to collect the sap. This is carried away and boiled until it solidifies; in some cases water and salt are added to assist solidification. Thus when mature the Gutta-percha tree is simply felled, cultivation being relieved of the delicate process of sucking the sap from a living tree (an operation exceedingly difficult and expensive with India-rubber), and resolving itself consequently into a systematic plantation in which so many trees are annually renewed. If the coast hills of India are climatically suited to the Gutta-percha tree, there would therefore seem every reason to expect a rich return were Government to request the Forest Department to plant out so many trees per annum in such forests as may be found suitable for this purpose.

Another interesting feature which the increasing demand for Gutta-percha must solve is the possibility of (in a simple way) transforming the milky sap of some of the numerous wild plants of India so as to render these serviceable as gutta substitutes. In the following enumeration of the Gutta-percha-yielding plants will be found a few on which it would seem highly desirable that systematic experiments should be performed with this object. If it could be possible to utilise the milk-sap of many of our wild **Euphorbias** or of **Calotropis gigantea,** an immense increased source of wealth would be thereby brought to light.

[24]—1. **Alstonia scholaris,** *R. Br.*, APOCYNACEÆ.

Vern.—*Satián, satwin,* HIND; *Chatwan,* BENG.

A tall, handsome, evergreen tree, common on the Sub-Himalayan tract, from the Jumna eastward, ascending to 3,000 feet in altitude. Plentiful throughout India and Burma in a state of cultivation.

One of the many forms of this tree has recently been discovered to be the source of the *Gutta-pulei* of Singapore. This tree has long been regarded in India as yielding an inferior India-rubber.

[44]—2. **Bassia mottleyana,** *De Vriese,* SAPOTACEÆ.

A tree of Malacca and Borneo, known in the vernacular as *kotian.* **Mr. Mottley** says that this tall and straight tree, when wounded, yields a copious flow of milky juice which hardens to a brittle, waxy resin, readily softened by heat. This has been described as an inferior kind of gutta-percha.

[61]—3. **Calotropis gigantea,** *R. Br.*, ASCLEPIADIACEÆ.

The madar or akanda, a plant scarcely to be distinguished from the following species, the properties and uses of which are identical, and both these plants may therefore be discussed jointly. **C. gigantea** is most abundant in the lower provinces and Eastern India, while **C. procera** is the species chiefly met with in Upper or Northern and Central India.

[62]—4. **C. procera,** *R. Br.*

Syn.—C. HAMILTONI, *Wall.*

Vern.—*Akand, ak, madar,* HIND.; *Akunda,* BENG.; *Auk,* NEPAL.; *Arka,* SANS.; *Aushar,* ARAB.; *Kharak,* PERS.; *Akda,* MAHR.; *Yercum,* TAM.; *Jilledu,* TEL.; *Mayo-bin,* BURM.

Small shrubs, the former sometimes becoming almost a bush, common everywhere throughout India, in waste lands, after luxuriating on the poorest soils, and largely cultivated as a hedge in some parts of the country. The fibre is perhaps the finest in India, but is difficult of separation.

The inspissated and sun-dried milky sap from the stem resembles Gutta-percha. The madar is in fact the most interesting and most hopeful plant not belonging to the natural order **Sapotaceæ,** which can be said to yield a substance resembling Gutta-percha ever likely to obtain a commercial

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reputation as a gutta-percha substitute. **Dr. Riddell**, the Superintendent Surgeon to the Nizam's army, was apparently the first to separate and experiment with this gum; his results having been published, in the first instance, by Captain (the late distinguished Colonel) **Meadows Taylor** in a letter to the Secretary, Agri-Horticultural Society of India, Vol. viii. Afterwards **Dr. Riddell** republished his discovery in the *Bombay Times* for 1852. As these letters may not be accessible to persons likely to be interested by this subject, I take the liberty of republishing the more important parts narrating the actual experiments :—

"My dear Sir,—I observe in the last number of the *Society's Transactions* that the mudár (*Asclepia gigantea*) affords a very valuable kind of hemp or flax; and I have now the pleasure to communicate to you another valuable property it possesses, which has been lately discovered by a friend here, under whose permission I make the present communications to you.

"Dr. Riddell, the Officiating Superintendent Surgeon of the Nizam's Army, had for some time been employed in extracting or determining by chemical experiments the well-known medicinal properties of this plant, and during his investigation, having had occasion to collect the milky juice or sap, and expose it to the air, found, as it gradually dried, that it became tough and hard, and not unlike gutta-percha. This induced him to treat the juice as that of the gutta-percha tree is done, and the result has been the obtaining of a substance apparently precisely analogous to gutta-percha, of which I have the pleasure to send you a specimen, bearing the impression of his seal, marked No. 1.

"The mode of preparing this substance is as follows:—

"The juice or sap to be collected by incision. An open slit may be made in the back of the plant and a pot tied to it, when it will flow into it; or it may be collected by cutting the back and catching as much as flows out at once. Dr. Riddell calculates that ten average-sized plants or bushes will yield as much juice as will make a pound of gutta-percha substance, but it is not known yet how far the plant will bear tapping without injury, nor how often, or at what intervals, the extractions of juice might be made.

"The juice extracted may either be exposed to the sun in a shallow vessel, or left to dry in the shade: by the former process, the substance becomes a little darker than by the latter.

"When it has attained a tough consistency, it may be well worked up in very hot water with a wooden kneader, or boiled; either process serves to remove an acrid property of the juice, as also all other matter but the gutta-percha itself. It is believed that the more it is boiled and worked up, the harder it will eventually become when cool.

"Comparison with the true gutta-percha gives the following results:—

"Sulphuric acid—chars it.

"Nitric acid—converts it into a yellow resinous substance.

"Muriatic acid—has very little effect upon it.

"Acetic acid—has no effect.

"Alcohol—ditto.

"Spirit of turpentine—dissolves it into a viscid glue which, when taken up between the finger and thumb, pressed together, and then separated, shows numberless minute and separate threads.

"The above chemical tests correspond exactly with the established results of the real gutta-percha.

"The substance, however hard it may have become, becomes immediately flexible in hot water, and readily takes any form required, receiving and retaining impressions of seals, ornaments, &c. It has been made into small cups and other vessels which are not found to alter in form.

"A test I suggested myself was, would it unite with gutta-percha, and this was satisfactorily proved in my presence. A piece of the real gutta-percha of similar size, with a piece of the new substance, was softened in hot water, and united readily.

"The tests by acids on the mixed substance did not differ from those on either of the two original substances. * * * * * * * *

"If the 'muddár' could be profitably grown for its hemp alone, it is evident, if this new substance proves in practice what it now appears to be, that an acre of cultivation of it would produce a large quantity of juice and thus materially enhance its value. The poorest land suffices for its growth, but I have no doubt that if cultivated and plentifully irrigated, not only would the yield of juice be larger, but the growth of the plant, and the fineness of its fibre when made into hemp, materially increased." (*Meadows Taylor, Agri.-Horti. Society's Journal, Vol. VIII.*)

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Dr. Riddell subsequently wrote:

"As regards my experiments with the 'muddár' juice, they are as follows:—Having collected about 18 fluid ounces I had it strained through a cloth, and exposed 13½ ounces of it to solar evaporation on a flat dish. In three days it became firm, separating itself from the dish and easily removed. I then placed it in boiling water, and worked it well about with a spatula, and when cool enough to handle, kneaded it with my fingers; when cool I found it to weigh a little more than six ounces. I then boiled it, and, as it cooled, worked it well again: and on weighing the substance, found it had lost one ounce. It was then pulled out into shreds and boiled a second time, kneading it whilst cooling, and four ounces two drachms, apothecaries' weight, was obtained of what I call 'muddár' gutta-percha.

"The next experiment was with four ounces of the juice, which weighed four ounces apothecaries' weight, and placing it in a basin, I poured about one quart of boiling water on it, stirring it up, and then leaving it to stand, when it broke into curds which fell to the bottom. I then partially poured off the fluid, and filtered the residue through paper, and on its being sufficiently dry to be removed, found it to weigh one ounce six drachms. It was then worked well in hot water two or three times, and formed into a mass which gave six drachms, thus losing one ounce. On the whole it will be seen that the most economical method of preparing the juice is by solar evaporation, the residue being nearly double to that of the second experiment."

Mr. Liotard publishes, in his Memorandum on the materials in India suitable for the Manufacture of Paper, the opinion of **Professor Redwood** upon Madar-gutta. The Professor considers it possesses many properties in common with Gutta-percha of commerce. The specimen so reported upon was collected by **Captain G. E. Hollings**, Deputy Commissioner, Shahpur (in the Punjab) in the year 1853, little more than one year after the date of the original discovery of this Gutta. We have learned nothing further in 30 years, and uncountable riches of fibre and gum have all the while been wasting along every roadside and over every rubbish heap.

[87]—5. **Dichopsis elliptica,** *Benth,* SAPOTACEÆ.

The *panchoti*, a large tree of the Western Ghats, yielding the Indian gutta-percha.

[88]—6. **Dichopsis Gutta,** *Benth. & Hook.*

THE FINEST GUTTA-PERCHA.

A large tree, indigenous to the Straits and Malayan Archipelago. The enormous demand for Gutta-perchas has exterminated this exceedingly valuable plant from all accessible places. It flourishes most on the sides of the hills near Perak.

There are two forms, one with red flowers known as *tuban-merut*, and the other with white flowers, *tuban-pateh*. The young trees require shade and a rich well-drained soil, hence the preference for hill-sides. No special period is observed for collecting the gutta. Full-grown trees, say 20 years old, are hewn down and tapped all along at distances of 18 inches. The yield is variously estimated at from 10, 15, 20, or even 40 cathies (a cathi is 1⅓ lbs.) a tree. Allowing 15 lbs. to be a fair average yield, to afford the amount exported from the Straits in 1875 there must have been destroyed 600,000 trees. The demand continues to exceed the supply, and if a protecting hand be not extended over the Gutta-percha forests, extermination must be inevitable.

Singapore and Penang are the chief collecting depôts.

[88]—7. **Dichopsis obovata,** *Clarke.*

An evergreen tree of Tenasserim, extending to Malacca and Penang. **Kurz** says it yields gutta-percha.

[89]—8. **Dichops polyantha,** *Benth.*

Vern.—*Tali,* BENG; *Sill-kurta,* CACHAR.

GUTTA-PERCHA.

A tree, 30 to 40 feet in height, occurring in Sylhet, Chittagong, and Pegu. Kurz says it produces a good quality of gutta-percha in large quantities, probably not inferior to that of Singapore.

9. **Gutta Sundek,** the second best form of gutta-percha, is at present unidentified. It occurs abundantly in the Malay Peninsula. M. **Beauvisage** identified it as **Keratephorus Leerii,** *Husk.*, but the Kew authorities regard this as incorrect, and **Dr. Trimen,** who, in the Ceylon Botanic Gardens, has succeeded in obtaining young seedlings, thinks it may prove a species of **Payena.**

[99]—10. **Dyera costulata,** *Hook. f.*, APOCYNACEÆ.

[100]—11 **D. laxiflora,** *Hook. f.*

Trees which inhabit the forests of Malacca, Singapore and Sumatra. They yield the *gutta-jelutong* of commerce.

[106]—12. **Euphorbia Cattimandoo,** *Elliot,* EUPHORBIACEÆ.

Vern.—*Kati Mandu,* TAM.

This yields the *Catimandu* cement of the Madras Presidency. It contains sufficient caoutchouc to make it a profitable source of supply, if not of India-rubber, at least of gutta-percha.

[107]—13. **Euphorbia neriifolia,** *Linn.*

Vern.—*Mansa-sij.*

Yields a milky sap which, on drying, much resembles gutta-percha, and for which there seems every probability of its being used as a substitute.

[108]—14. **Euphorbia pulcherrima,** *Willd.*

Dr. Riddell recommends this, as also the next species, as suitable for the preparation of gutta-percha.

[109]—15. **Euphorbia resinifera.**

This plant yields the gum known as **Euphorbium,** now largely used as an anticorrosive paint for the bottoms of ships; it comes chiefly from Morocco and Barbary. Its resisting the action of water depends upon its resemblance to gutta-percha.

[110]—16. **Euphorbia Tirucalli,** *Linn.*

Vern.—*Lankasij,* BENG.; *Sehud,* HIND.; *Tiru kalli,* MAL.; *Sha-soung-leknyo,* BURM.

A small tree cultivated throughout India and used as a hedge.
Dr. Riddell says this yields a fairly good gutta-percha.

[159]—17. **Mimusops manilkara,** *Don.*, SAPOTACEÆ.

THE SAPOTA TREE.

Largely cultivated on account of its fruit in Bengal; yields the Mexican chicle-gum, a substance closely resembling gutta-percha.

[166]—18. **Payena Maingayi,** *C.B.C.*, SAPOTACEÆ.

A tree of Malacca and Penang, said by **Maingay** to abound in gutta-percha.

In drawing up the above lists of gutta-yielding plants, I have borrowed largely from the *Kew Report for 1881;* from *Spons' Encyclopædia,* and from *Journal of the Agri.-Hort. Society; the Government Proceedings;* and *Mr. Baden-Powell's Punjab Products.*

HARDWICKIA.

173 **Hardwickia binata,** *Roxb.*, LEGUMINOSÆ.

Vern.—*Anjan,* HIND., MAR.; *Acha, alti,* TAM.; *Naryepi, yapa,* TEL.; *Kamrá,* KAN.; *Parsid,* SINGROWLI.

Found in the dry forests of South and Central India, as far north as the Banda district of the North-West Provinces.

It yields a gum.

174 **H. pinnata,** *Roxb.*

Vern.—*Kolávu,* TINNEVELLY; *Matáyen samprâni,* TRAVANCORE; *Yenne,* MANJARABAD.

Found on the Western Ghâts from South Kanara to Travancore.

Exudes a red sticky substance, similar to **Copaiba Balsam.** It is a thick, viscid fluid, used medicinally in India as a good substitute for **Copaiba.**

175 **Hog-gum.**

This is chiefly obtained from **Symphonia globulifera,** *Linn.*, GUTTIFERÆ, Persian Hog Tragacanth. *See* **Prunus Amygdalus.**

HOLIGARNA.

176 **Holigarna longifolia,** *Roxb.*, ANACARDIACEÆ.

Vern.—*Barola,* BENG.; *Khreik,* MAGH.; *Húlagiri,* BOM.

A tall tree, native of Eastern Bengal, Chittagong, and Pegu. The Bombay form seems most probably to be **H. Arnoottiana,** *Hook. f.*

It yields a dichromic exudation, which causes blisters. This, on hardening, forms a sort of gum-resin.

HOPEA.

177 **Hopea odorata,** *Roxb.*, DIPTEROCARPEÆ.

THE ROCK DAMMAR OF COMMERCE.

Vern.—*Rimda,* AND.; *Thingan,* BURM.

Found scattered in the evergreen forests of British Burma and the Andaman Islands.

It yields a yellow resin, from which the Andamanese prepare a sort of wax. Specimens and additional information much required. (*See* **Poon-yet.**)

ISONANDRA.

178 **Isonandra obovata,** *Griff.*, SAPOTACEÆ.

Vern.—?

An evergreen tree of Tenasserim.

It yields a sort of gutta-percha. Gamble, who mentions this fact, seems doubtful whether the plant should not be referred to **Dichopsis.**

JATROPHA.

Jatropha Curcas, *Linn.*, EUPHORBIACEÆ. 179

Vern.—*Bag-bherenda, safed ind,* HIND., BENG.; *Kaat-amunck,* TAM.; *Thinbawkyetsu,* BURM.

Indigenous in America; cultivated in most parts of India, especially in Coromandel and Travancore.

Dr. Dymock informs me that when wounded a viscid juice flows from this plant, which gradually dries into a substance resembling shell-lac in colour and consistence. The juice is used by the natives like collodion to close wounds.

JUNIPERUS.

Juniperus communis, *Linn.*, CONIFERÆ. 180

Vern.—*Núch, pethra, bentha, betar, lang shúr, chichia,* HIMALAYAN NAMES.

North-West Himalayas, ascending to 14,000 feet.
Wood highly resinous.

J. excelsa, *M. Bieb.* 181

HIMALAYAN PENCIL CEDAR.

Vern.—*Dhúp, padám,* N. W. P.; *Chalai, shúkpa, luir, shúrbuta,* HIMALAYAN NAMES; *Dhúpi,* NEPAL; *Apúrs,* BELUCHISTAN.

Arid tract of the North-West Himalaya and Western Tibet, extending eastward to Nepal, and in the mountains of Afghanistan and Beluchistan.

It yields a resin, from which *Dhúp* is prepared in India. (*Atkinson.*) Dr. Dymock informs me that the *Dúhp* of Bombay commerce is **Boswellia** bark imported from Aden. *See* **Boswellia.**

J. recurva, *Ham.* 182

Vern.—*Bettir, bhedára, gúggal, agáni,* N. W. P.; *Wetyar, bettar, phulu,* PB.

Sikkim and Bhutan. One of the great sources of *Dhúp* or incense in India. (*Atkinson.*) The resinous twigs are used for incense.

Kino. *See* **Butea frondosa,** *Roxb.*, and **Pterocarpus Marsupium,** *Roxb.*, LEGUMINOSÆ. [69] [23

LAC.

Lac. 183

A resinous incrustation, caused by the parasitic action of an insect, Coccus Lacca. The twigs so encrusted are known as *stick-lac.* When broken off from the twigs and washed in water, the resin breaks up into small particles, known as *seed-lac;* while the water used in the washings yields *lac-dye.* Seed-lac, when melted over a fire and squeezed through a long sack into troughs, spreads out into thin flakes known as *shell-lac.* If dropped into rounded masses, it is *button-lac;* if into larger pieces, it is *sheet-lac* or *piece-lac.*

LAC.

The following are the plants on which the Lac insect is found, and specimens of each, together with all available information and any additional trees, will be most acceptable:—

1. **Acacia arabica,** *Willd.* (Leguminosæ). The *Babul* or *Kikar; Gamble, 151.* "In Sind and Guzerat yields large quantities of lac."
2. **Acacia Catechu,** *Willd.* (Leguminosæ).
3. **Albizzia lucida,** *Benth., Silkori,* BENG.
4. **Aleurites moluccana,** *Willd.* (Euphorbiaceæ). The *Akrot,* introduced from Malay, now almost wild, especially in South India.
5. **Anona squamosa,** *Linn.* (Anonaceæ). The *Ata,* a tree introduced from the West Indies.

ECOND
EST LAC.
Common).

6. **Butea frondosa** *Roxb.* (Leguminosæ). The *Dhak* or *Palas.*
7. **Butea superba,** *Roxb.* (Leguminosæ). A climber, scarcely distinguishable from the tree *B. frondosa,* except by its habit.
8. **Carissa Carandas,** *Linn.* (Apocynaceæ). Var. *spinarum,* sp., *A. DC.*
9. **Celtis Roxburghii,** *Bedd.* (Urticaceæ). Eastern Bengal, Central and South India.
10. **Ceratonia Siliqua** (Leguminosæ). The Carob Tree; now almost naturalised in the Punjab and South India.
11. **Croton Draco,** *Schlech.* (Euphorbiaceæ).
12. **Dalbergia latifolia,** *Roxb.* (Leguminosæ).
13. **Dalbergia paniculata,** *Roxb.* (Leguminosæ).
14. **Dichrostachys cinerea,** *W. & A.* (Leguminosæ). The *Virtuli,* a shrub of Central and South India.
15. **Dolichandrone Rheedii,** *Seem.,* a small tree of Burma and the Andaman Islands.
16. **Eriolæna Hookeriana,** *W. &A.* (Sterculiaceæ). (*Eriolæna spectabiles* yields fibre.)
17. **Erythrina indica,** *Linn.* (Leguminosæ).
18. **Feronia Elephantum,** *Correa.* (Rutaceæ).
19. **Ficus bengalensis,** *Linn.* (Urticaceæ).
20. **Ficus comosa,** *Roxb.,* in Assam.

SSAM
C TREE.

21. **Ficus cordifolia,** *Roxb.; Gamble, 335;* Assam Lac.
22. **Ficus elastica,** *Bl.* The India-rubber Tree (the *Bar*).
23. **Ficus glomerata,** *Roxb.*
24. **Ficus infectoria,** *Willd.* The *Pakar* or *Keol.* (Young buds are eaten, and the bark yields a fibre.)
25. **Ficus laccifera,** *Roxb.* A native of Sylhet, the *Ruthal But.*

ry good
Lac,
mmon.

26. **Ficus religiosa,** *Linn.* The *Aswat* or *Pipal.* (The *Gori* or *Deomuga* silk-worm feeds upon it.)
27. **Garuga pinnata,** *Roxb.* (Burseraceæ). The *Garuga* or *Kaikar.*
28. **Kydia calycina,** *Roxb.* (Malvaceæ). A small tree, the *Pola.* The inner bark yields a good fibre.

mmon.

29. **Lagerstrœmia parviflora,** *Hook. f.* (Lythraceæ). The *Bakli* or *Sida* (one of the trees upon which the Tasar silk-worm is found).
30. **Mangifera indica,** *Linn.* (Anacardiaceæ). The Mango, in its wild state, often yields lac.
31. **Nephelium Litchii,** *Camb.* (Sapindaceæ). The Litchi.
32. **Ougeinia dalbergioides,** *Benth.* (Leguminosæ). The *Sandan.*

LAGER-STRŒMI

33. **Prosopis spicigera,** *Linn.* (Leguminosæ). The *Jhand* of the arid zones of the Punjab and Guzerat; a very useful tree, being the chief steam-fuel in those regions.

KINO-LA

34. **Pterocarpus Marsupium,** *Roxb.* (Leguminosæ). The *Bija* or *Kino* tree, a native of Central and South India.

35. **Pithecolobium dulce,** *Benth.* (Leguminosæ). The *Dakhini babul,* a tree introduced from Mexico.

36. **Schima crenata,** *Korth.* (Ternstrœmiaceæ). An evergreen tree of Burma.

BEST LA TREE KUSUM

37. **Schleichera trijuga,** *Willd.* (Sapindaceæ). The *Kusum, Koosum,* or *Kusumb.* This is the most important of all the lac trees. It is a native of the Sub-Himalaya, Central and South India, and Burma.

CHUTIA NAGPU

38. **Shorea robusta,** *Gaertn.* (Dipterocarpeæ). The *Sál* Tree. The ease with which this plant coppices, and its power of endurance and rapid growth, make it one of the best trees for lac cultivation.

MADRAS LAC.

39. **Shorea Talura,** *Roxb.* A native of Mysore; sometimes called *S. laccifera* or *Vatica laccifera.*

40. **Tectona grandis,** *Linn.* (Verbenaceæ). The *Teak-wood,* a native of Central and South India and Burma.

41. **Terminalia tomentosa,** *W. & A.* (Combretaceæ). The *Saj, piasal,* or *asan.*

Principal PUNJA LAC.

42. **Zizyphus Jujuba,** *Lam.* (Rhamneæ). The *Ber* or *Kul.* Although the lac yielded by this tree is inferior in quality, the ease with which it may be propagated makes it a good lac-yielding tree, suited specially to the Punjab.

43. **Zizyphus zylopyra,** *Willd.* (Rhamneæ). The *Kat-ber.*

The following are the specimens of Lac in the Bengal Economic Museum; the trees from which derived cannot be determined:—

STICK LAC, Nos. 2005, 2010, 2024, 2025, 3706, 3707, 4072, 4089, 4416, 4417, 4482, 4630, 5009, 5034, 6410, 7661, 8106, 8867, 8871, 9087, 9088, 9089, 9090, 10960, 11500, 11859, 11996, 12067, 12208, 12263, 12264, 12265, 12564, 12715, 12716, 12717, 12718, 12756, 12757, 12758, 12759, 13107, 13397, 13398.
SEED LAC, Nos. 1362, 2006, 2011, 2218, 3060, 4010, 4433, 4677, 6364, 7662, 9507, 10887, 12261, 12714, 13399, 13400, 13401, 13402, 13403.
SHELL LAC, Nos. 2008, 2013, 2022, 3439, 9091.
PIECE AND BUTTON LAC, Nos. 2014, 3438, 7663, 7731, 8107, 9092, 11881, 12760.
SEALING WAX, Nos. 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 12963.

LAGERSTRŒMIA.

Lagerstrœmia Flos-Reginæ, *Retz.* 184

Syn.—L. REGINÆ, *Roxb.*

Vern.—*Jarúl,* BENG.; *Ajhar,* ASS.; *Tamana,* MAHR.; *Kadali,* TAM.; *Challá,* KAN.; *Pyinma,* BURM.; *Murute,* CINGH.

Found in East Bengal, Assam, Burma, and on the West Coast, extending north to Ratnagiri.

It yields a gum-resin.

L. parviflora, *Roxb.,* LYTHRACEÆ. 185

Vern.—*Bákli, jhaura, sida,* HIND.; *Sida,* BENG.; *Kanhil,* LEPCHA; *Lahana bodara,* MAHR.; *Chinangi,* TEL.; *Zaungbale,* BURM.

Grows in the Sub-Himalayan tract, from the Jumna eastward, in Oudh, Bengal, Assam, Central and South India.

It yields a sweet gum-resin.

186 **Lagerstrœmia tomentosa,** *Presl.*, LYTHRACEÆ.

Vern.—*Lesa,* BURM.

A large deciduous tree of Burma; frequent in Pegu and Martaban. Exudes a red resin. (*Kurz.*)

LIQUIDAMBAR.

187 **Liquidambar orientalis,** *Miller,* HAMAMELIDEÆ.

LIQUID STORAX.

Vern.—*Siláras,* HIND. and BOM.; *Miah-sayelah,* ARAB.; *Silkaka,* SANS.; *Neri-arishippál,* TAM.

A handsome tree, resembling a plane, often growing to the height of 40 feet and forming forests in the south-western part of Asia Minor. *Liquid Storax* or *Rose Malloes* is imported into Bombay from Asia Minor, and is much used in Hindu medicine. It is largely exported from Bombay to China, where it has for many centuries been used as a medicine, having been formerly carried into China by the Arabs as far back as during the Ming dynasty, A.D. 1368-1628.

The method of èxtraction of Liquid Storax is curious. It is carried on by Turcomans. They strip off the outer bark and reject it. The inner bark is then scraped off and thrown into pits until a sufficient quantity has been collected. By boiling in a copper vessel the resin is afterwards separated from the residue. The boiling is said to be done with brackish water. The residual bark is then placed in hair bags and subjected to pressure, when a further proportion of the oleoresin is obtained. The dried and compressed bark is then made into cakes, and constitutes the fragrant cakes formerly common and well known in Europe under the name of **Cortex Thymiamatis.** The resin is opaque and semi-fluid. (*Pharmacographia.*) Dr. Dymock, in his *Materia Medica of Western India,* says that in Arabic and Persian works there are three kinds generally described—*1st,* that which exudes naturally; *2nd,* that which is obtained by pressing the bark; and *3rd,* that which is obtained by boiling it. These three kinds are, however, not distinguished in commerce. Mahomedans regard **Liquidambar** as tonic, resolvent, suppurative and astringent. It is a favourite application in swellings and in orchitis, and recently has got a continental reputation in the cure of scabies, for which purpose it is mixed with linseed oil. See also **Altingia excelsa,** *Noronha.*

MACARANGA.

188 **Macaranga indica,** *Wight.*, EUPHORBIACEÆ.

Vern.—*Boura,* BENG.; *Lal mallata,* NEPAL; *Modala,* ASS.; *Chanda,* MAHR.; *Dagdakti,* MECHI.

Sikkim, Khâsia Hills, Andamans and the Western Ghâts.

It yields a red gum-resin. This same gum is also given by an allied species **M. denticulata,** *Müll.* (*Taungpetwun,* Bom.), but in such small quantities that it hardly deserves mention as a gum-yielding tree. The same may also be said of **M. gummiflua,** *Müll.*

189 **M. tomentosa,** *Wight.*

Vern.—*Chanda,* BOM.; *Vatti kanni,* TAM.; *Chenthakanni,* MYSORE.

Western Ghâts.

Yields a gum, used medicinally, and for taking impressions. (*Gamble.*)

MANGIFERA.

Mangifera indica, *Linn.*, ANACARDIACEÆ. 190

Vern.—*Am,* HIND.; *Ghariam,* ASS.; *Amba,* MAHR.; *Mad, mangas,* TAM.; *Mamadi,* TEL.; *Thayet,* BURM.

Wild on the Western Ghâts; cultivated all over India.
Its bark yields a gum.

Mecca Balsam. *See* **Balsamodendron Opobalsamum,** *Kunth.*, BURSERACEÆ. [43]

MELANORRHŒA.

Melanorrhœa usitata, *Wall.*, ANACARDIACEÆ. 191

THE BLACK VARNISH TREE of Burma.

Vern.—*Kheu,* MANIPUR; *Thitse,* BURM.

Found in Manipur and Burma.
The black varnish made from this plant is much used by the Burmese in their lacquer-work as a size in gilding, for writing in palm-leaf books, and for many other purposes (*Gamble.*) Specimens of this gum and varnish, as also articles prepared with it, are much required from Burma, and it is hoped special attention will be given to this subject so as to secure a good representation.

MELIA.

Melia Azadirachta, *Linn.* 192

THE NEEM TREE or MARGOSA TREE.

Syn.—AZADIRACHTA INDICA, *Adr. Juss.*

Vern.—*Ním.,* HIND., BENG.; *Betain,* KUMAUN; *Kohumba,* GUZ.; *Nimba,* MAHR.; *Veypam,* TAM.; *Yapa,* TEL.; *Thinbawtamaka,* BURM.

Planted and self-sown throughout the greater part of India and Burma.
A gum, used as a stimulant, exudes from the bark. **Birdwood** includes it among the gums which make up the *Gum Gattie* of commerce.
The Ním tree is largely cultivated in North India around villages, owing to a very widespread belief, which even some Europeans have faith in, that the vapour from the tree is a preventative against fever.

M. Azedarach, *Linn.*, MELIACEÆ. 193

THE PERSIAN LILAC, BASTARD CEDAR, or BEAD TREE.

Vern.—*Drek, bakâin, betáin,* HIND.; *Ghora-nim,* BENG.; *Chein,* SUTLEJ; *Malvembu,* TAM.; *Ta-ma-ka,* BURM.

Commonly cultivated throughout India, and believed to be indigenous in the outer Himalaya and Siwalik tract.

M. sempervirens, *Sw.* 194

This species is often given as a synonym for M. AZEDIRACH, *Linn.*

Vern.—*Bukhain.*

A gum sent from Madras to the Punjab Exhibition, of which **Mr. Baden-Powell** says that "it looks like *Mochras.*"

MIMUSOPS.

195 **Mimusops Elengi,** *Linn.*, SAPOTACEÆ.

Vern.—*Bakul, bohl,* BENG.; *Maulser, maulsari,* HIND.; *Ovali,* MAHR.; *Magadam,* TAM.; *Khaya,* BURM.; *Bokal, mugali,* KAN.

Wild on the Western Ghâts as far north as Khandalla, N. Circars, Burma, Andaman Islands, and Ceylon. Most probably only cultivated in other parts of India.

It yields the *Pogada* gum of Madras. (*Spons' Enc.*)

196 **M. hexandra,** *Roxb.*

Vern.—*Rânjana,* MAHR.

Yields, when wounded, a white opaque gum, which is made no use of.

197 **M. indica,** *A. DC.*

Vern.—*Khir, khirni,* HIND.; *Rain,* MEYWAR; *Palla, kannu-palle,* TAM.; *Palle panlo,* TEL.; *Palu,* CINGH.

Mountains of South India, extending in Central India to the sandstone hills of Pachmari, north of the Godavari.

Yields a gum.

198 **M. manilkara,** *Don.*, SAPOTACEÆ.

THE SAPOTA, SAPODILLA, BALLY TREE OR NEESBERRY.

Syn.—ACHRAS SAPOTA, *Linn.*

Vern.—*Simi, elupi,* TAM.; *Sima, ippa,* TEL.; *Twottapat,* BURM.

A tree largely cultivated in Bengal for its fruit. It yields a substance resembling gutta-percha which, in Mexico, is known as Chicle-gum. On mixing with gutta-percha or rubber, this gum is said to render them brittle, and thus to destroy one of their most useful properties. Several other American species of this gum yield similar gums, of which **M. globosa** may more particularly be mentioned as yielding **Gum Batata.**

MORINGA.

199 **Moringa pterygosperma,** *Gaertn.*, MORINGACEÆ.

THE HORSE-RADISH TREE.

Vern.—*Soanjna, sanjna,* HIND.; *Sajna, sujana* BENG.; *Shegava,* MAHR.; *Morunga,* TAM.; *Danthalon,* BURM.

Wild in the Sub-Himalayan tract, from the Chenab to Oudh; commonly cultivated in India and Burma.

It yields a gum which is white when it exudes, but gradually turns to a mahogany colour on the surface; used in native medicine. It belongs to the tragacanth or hog-gum series and of no European commercial value, and is one of the gums often called *mocharas.*

MORUS.

200 **Morus indica,** *Linn.*, URTICACEÆ.

One of the MULBERRY TREES.

Vern.—*Tutri,* HIND.; *Tût,* BENG.; *Tûl,* PB.; *Chhota kimbu,* NEPAL; *Nuni,* ASS.; *Posa,* BURM.

Sub-Himalayan tract; cultivated throughout India.

Chiefly cultivated on account of its leaves, upon which the Assam *Pat* (**Bombyx textor**) silk-worm is fed. **Atkinson**, in his *Himalayan Districts, p. 783*, mentions this plant as yielding gum. Specimens and further information much required.

MYRISTICA.

Myristica corticosa, *Hook., f., and Th.*, Myristiceæ. 201

M. Longifolia, *Wall.* 202

Vern.—*Zadeitbo*, Burm.

Evergreen trees of Burma. Exude a red resin. (*Kurz.*)

NERIUM.

Nerium suaveolens (?) Apocynaceæ. 203

A red gum sent from Madras to Punjab Exhibition under this name. I can find no mention of **N. suaveolens** in botanical works; specimens for identification of both gum and plant would be very interesting.

ODINA.

Odina Wodier, *Roxb.*, Anacardiaceæ. 204

This is known in Europe as Ging or Kuni Gum.

Vern.—*Kiamil, kimúl, jhingan, mowen*, Hind.; *Jiyal, lohar bhadi*, Beng.; *Jhingan, jiban, sindan harallú*, N. W. P.; *Shimti, moya*, Mahr.; *Wodier*, Tam.; *Gumpini*, Tel.; *Kaikra*, Gond; *Nabé*, Burm.

Grows in the Sub-Himalayan tract, from the Indus eastward, and in the forests of India and Burma.

The dark-red gum of this tree was sent to the Punjab Exhibition from Madras. **Roxburgh** describes the gum as resembling pieces of glue. As it exudes from the tree it is white (*kanne-ki-gond*), after falling to the ground it becomes black (*jingan-ki-gond*). The former is much more valuable than the latter. This gum is often used with the gum of **Anogeissus latifolia** in calico-printing, and the Brahmins of Bengal use it to stiffen their Brahimincal strings. It is found exuding from the trees in great stalactitic masses about October, the thin tips of which are perfectly translucent. The larger masses resemble dirty jelly, quite soft and very adhesive, drying rapidly, leaving a varnished-like appearance on the fingers or finger nails. With age it becomes black and rapidly degenerates into a powder.

Olibanum. *See* **Boswellia floribunda,** *Endl.*, Burseraceæ. [64]

Opobalsamum. *See* **Balsamodendron opobalsamum,** *Kunth.*, Burseraceæ. [43]

OPOPANAX.

Opopanax chironeum, *Kock.*, Umbelliferæ. 205

A gum-resin said to be imported into Upper India from Persia, and used in native medicine. The gum occurs in small round tears, yellow outside and whitish-yellow within. It burns with a peculiar odour, and has a bitter taste. It forms a milky solution when mixed with spirits, vinegar, or water. **Dr. Dymock** informs me he has never seen this gum in India.

OSTODES.

206 **Ostodes paniculata,** *Bl.*, EUPHORBIACEÆ.

Vern.—*Bepari*, NEPAL.; *Palok*, LEPCHA.

Sikkim and Khásia Hills.

Yields a gum, used as size in paper manufacture. A considerable demand for gums and resins suitable for the paper trade already exists and is certain to increase. It would therefore be very valuable were samples, sufficiently large to admit of their being tested, to be supplied, accompanied with information regarding annual amount likely to be available, and price.

OUGEINIA.

207 **Ougeinia dalbergioides,** *Benth.*, LEGUMINOSÆ.

Vern.—*Sándan, asainda, tinnas*, HIND.; *Shánjan, pánan*, OUDH; *Bandhona*, URIYA; *Dargu, tella motku*, TEL.; *Telus*, KHANDESH.

Grows in the Sub-Himalayan tract, from the Sutlej to the Teesta, Central India and West Coast.

The tree yields an astringent red gum. The bark also is astringent, and is used to poison fish.

PARAMERIA.

208 **Parameria glandulifera,** *Benth.*, APOCYNACEÆ.

Vern.—*Taline-no-thee*, BURM.

An extensive climber on the tidal forests of Burma, extending to Malacca, Singapore, the Andaman Islands, and distributed to Java and Borneo.

Recently this plant has attracted considerable attention as a source of India-rubber, said to be equal to American rubber. (*Dr. Romanis, Burma.*)

PARKIA.

209 **Parkia insignis,** *Kurz*, LEGUMINOSÆ.

Vern.—*Myouk-tanyet*, BURM.

A tree met with in the tropical forests of Martabar east of Tonghoo. Exudes a red resin. (*Kurz.*)

PAYENA.

210 **Payena Maingayi,** *C. B. Clarke*, SAPOTACEÆ.

A tree of Malacca, yielding gutta-percha, which see.

PENTACE.

211 **Pentace burmannica,** *Kurz*, TILIACEÆ.

Vern.—*Thitka*, BURM.

An evergreen tree frequent in the tropical forests of the eastern and southern slopes of the Pegu Yomah and from Martaban down to Upper Tenasserim.

Exudes a red resin. (*Kurz.*)

PHŒNIX.

Phœnix sylvestris, *Roxb.*, PALMÆ. 212

Vern.—*Khajur, khaji, salma, thakil,* HIND.; *Shindi,* MAHR.; *Periaeetcham,* TAM.; *Pedda eita,* TEL.; *Seindi,* BERAR.

Wild and cultivated throughout India.

It yields a gum little known.

PHYLLANTHUS.

Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ. 213

Vern.—*Daula, amla, amlika, aura,* HIND.; *Amla, ambolati, amulati* BENG.; *Ambal, ambli,* PB.; *Ambari,* GARO; *Amluki,* ASS.; *Anvalá,* MAHR; *Nelli, nellekai,* TAM.; *Zibya,* BURM.

A tree of the forests of India and Burma.

It yields a gum.

PINUS.

Pinus excelsa, *Wall.*, CONIFERÆ. 214

Vern.—*Raisalla, kail,* HIND.; *Chír, chíl,* PB.; *Yara,* KASHMIR; *Purni,* AFG.

Grows on the Himalayas.

The plant is very resinous; the wood is used for torches, and from it turpentine is prepared.

P. Gerardiana, *Wall.* 215

Vern.—*Chilghosa,* AFG.; *Chiri, kashti, ri, kannucli,* HIMALAYAN NAMES.

Grows on the inner dry and arid North-West Himalaya.

The seed forms an article of food in Kanáwár, and the tree yields resin. **Major Longden** extracted excellent tar from the chips. **Gordon** says that it affords abundance of fine turpentine, and the cones exude a copious white resin.

P. kasya, *Royle.* 216

Vern.—*Dingsa,* KHASIA; *Tinyu,* BURM.

Khásia Hills, Chittagong, Burma, and Manipur, descending to 2,000 feet in altitude.

It is rich in resinous matter.

P. longifolia, *Roxb.* 217

THE LONG-LEAVED PINE.

Vern.—*Chíl, chír,* PB.; *Salla, sapin, kolan,* GURHWAL and KUMAUN; *Gandha bisosa,* BOM.

Grows on the outer North-Western Himalaya, and in Sikkim and Bhutan.

Yields a true oleo-resin, which, when distilled, forms turpentine; tar also is prepared from it. There are two kinds of resin: (1) the *berja* sort, which comprises the tears exuding naturally from the bark; and (2) the *bokhar berja,* or the resin produced by making deep and long incisions into the sap-wood. In Bengal the resin is known under the name of *Gandhbirosa.*

Dr. Dymock informs me that the native doctors in Western India distil an oil from it which they call khunro-oil; it is used in gonorrhœa.

PIPER.

218 **Piper Cubeba,** *Linn.*, PIPERACEÆ.

CUBEBS, *Eng.;* CUBEBES, *Fr.*

Syn.—CUBEBA OFFICINALIS, *Miq.*

Vern.—*Kabab-chini,* BENG.; *Val-milaku,* HIND.; *Kankola,* MAHR.; *Taka miriyala,* TAM.; *Sinban-karawa,* TEL.

Wild in Java; introduced into India, or cubebs imported.

A gum-resin may be prepared from this plant.

PISTACIA.

219 **Pistacia cabulica,** *Stocks.*, ANACARDIACEÆ.

Vern.—*Mastaki.*

Dr. Aitchison (*Linnæn Society's Journal, XVIII, p. 42*) says that this small tree is occasional from Thal to Shálizán.

The resin is known in Europe as Bombay mastic; it comes to Bombay in small boxes from Afghanistan.

220 **P. integerrima,** *J. L. Stewart.*

Vern.—*Kakrasinghi,* BENG.; *Kaka, kakkar, kangar, tungu,* PB.

A tree, with rough bark, met with on the Sulaiman Range, the outer North-Western Himalaya, extending eastward to Kumaun. Altitude 6,000 feet.

Is said to yield a gum.

221 **P. Lentiscus,** *Linn.*

A shrub of the Mediterranean regions, imported into India.

It yields the mastiche of Chios. It occurs in small brittle tears of a pale, yellow colour, fragrant when heated. This substance is used in medicine, and as a varnish in the arts. It contains a small portion of volatile oil, about 90 per cent. of a resin soluble in alcohol, and about 10 per cent. of a resin insoluble in cold and soluble in hot alcohol.

222 **P. Terebinthus,** *Linn.*

This plant is a native of North Africa; from it is obtained a semi-fluid resin known as **Chian Turpentine.** Of late years this has attracted considerable attention in Europe in the treatment of uterine cancer. This semi-liquid resin is obtained by making incisions on the stem and branches. The plant is found cultivated (or wild) in Egypt, Palestine and Algeria, and might easily be introduced into India with profit, since there is a growing demand for **Chian Turpentine.**

223 **P. vera,** *Linn.*

The PISTACHIO-NUTS, which are imported into India from Afghanistan, form the fruit of this tree.

A gum also is said to be obtained from this plant.

PITHECOLOBIUM.

224 **Pithecolobium lobatum,** *Benth.*, LEGUMINOSÆ.

Vern.—*Tanyin,* BURM.

An evergreen tree met with in the forests from the Pegu Yomah and Martaban down to Tenasserim. Frequently cultivated by the Burmese.

Exudes a blackish resin. (*Kurz.*) **P. Saman** exudes a clear yellow gum. (*T. W. Oliver.*)

POINCIANA.

Poinciana elata, *Linn.*, LEGUMINOSÆ. 225

Vern.—*Sankásura*, MAHR.; *Padenarayan*, TAM.; *Sunkeswar*, TEL.; *Nirangi*, KAN.

Found in the forests of South India and the Western Peninsula; planted elsewhere. It was introduced from Madagascar, and is now found planted all over India.

The gum was sent from Madras to the Punjab Exhibition. The tree yields gum.

PONGAMIA.

Pongamia glabra, *Vent.*, LEGUMINOSÆ. 226

Vern.—*Karanj, papar*, HIND.; *Dalkaramcha, karanja*, BENG.; *Pong*, TAM.; *Kanga*, TEL.; *Thinwin*, BURM.

Grows in the Sub-Himalayan tract, from the Ravi eastward, in Bengal Burma, Central and South India.

It yields a thick, black, opaque gum. (*Spons' Enc.*) Dr. Dymock writes me to say that he has never seen any gum on this 'tree, and that gum does not exude when the tree is wounded.

Poon-yet or **Pwainget.** *See* **Pwenyet.** [241]

POPULUS.

Populus balsamifera, *Linn.*, SALICINEÆ. 227

Vern.—*Phalsh, makkal*, PB.; *Berfa, changma*, W. TIBET.

A large tree of the inner arid Himalaya and Tibet, 8,000 to 14,000 feet.

The leaves and the branches are full of balsamic juice, which also exudes from fresh cuts between the bark and the wood. (*Gamble.*)

PROSOPIS.

Prosopis glandulosa, *Torr.*, LEGUMINOSÆ. 228

THE "MESQUIT OR ALGAROBA OF TEXAS."

A native of the mountain regions of Western Texas. Successfully introduced into India by the Department of Agriculture and Commerce of the North-Western Provinces.

It yields a large quantity of gum, resembling gum-arabic, often used as a mucilage in making jujubes.

P. spicigera, *Linn.* 229

Vern.—*Shami*, BENG., MAHR., URIYA; *Jhánd, khár*, PB.; *Samada, sami, kandi*, or *kundi*, SIND; *Khijra*, RAJPUTANA; *Semru*, GUZ.; *Perumbi*, TAM.

A moderate-sized tree of Punjab, Sind, and the Western Peninsula.

It yields a gum, similar to gum-arabic.

PRUNUS.

230 **Prunus Amygdalus,** *Baill.*, ROSACEÆ.

THE ALMOND.

Vern.—(VAR., SWEET ALMONDS) *Bádám,* (BITTER ALMONDS) *Kurwe-bádam,* HIND., BOM.; *Vádam-kottai,* TAM.; *Kashappu vadam kottai,* TEL.; *Lous-ul-murr,* ARAB.

This tree yields the Badam or Hog Tragacanth exported from Persia into Bombay, and re-exported to Europe. It is used as a substitute for the true Tragacanth. The Hog-gum of European commerce is obtained from a tree (**Symphonia globulifera,** *Linn.*, GUTTIFERÆ), a native of tropical South America and the West Indies, and recently discovered in Africa.

231 **P. armeniaca,** *Linn.*

THE APRICOT.

Vern.—*Chúari, khubani, sard álu,* HIND.; *Hari, gardalu, shirán, kush,* PB.

Cultivated in the Western Himalaya.

The tree yields a gum similar to Tragacanth. This, with all the gums from the members of this genus, is known commercially as Cherry gum. Of this series the gum from the true cherry is the most valuable, being more soluble than the others, and used commercially in France.

232 **P. Cerasus,** *Linn.*

THE CHERRY.

Syn.—P. CAPRONIANA, *DC.*

Vern.—*Alú balú,* or *Alu-bu-ali,* PERS.; *Kerásya,* ARAB.; *Gilás, olchi,* PB.

Is generally cultivated in the North-Western Himalaya.

Yields cherry gum. The kernels are sold for medicinal purposes; they contain a small quantity of prussic acid, and are supposed to strengthen the nervous system.

233 **P. communis,** *Huds., forma* ALÚCHA.

THE PLUM.

Syn.—P. ALOOCHA, *Royle;* P. BOKARIENSIS, *Royle.*

Vern.—*Aloo bokhárá,* HIND., BOM., PERS.; *Alucha, olchi, shaft álu,* PB.; *Alpo-gáda-pasham,* TAM.

Cultivated from Garhwal to Kashmir in the Western Himalaya.

Yields a yellow gum not of any value; it somewhat resembles gum-arabic, and is often known as Persian gum.

The Bokhara plum is largely used in a dry state, and in fact it may be regarded as the officinal plum of India. It is sub-acid, digestive and aperient, and may be advantageously used in the preparation of medical confections.

234 **P. Padus,** *Linn.*

Vern.—*Páras, kalakat, sambu, dudla,* PB.; *Hlo sa hlot-kúng,* LEPCHA.

Himalaya, from the Indus to Sikkim.

Yields sparingly an inferior gum.

P. persica, *Benth. & Hook.* 235

THE PEACH.

Vern.—*Aru, aor,* PB.; *Ghwareshtai,* AFG.; *Shúftálú,* PERS.

Commonly cultivated throughout the Himalaya and in Upper Burma. Yields scantily an unimportant gum.

P. Puddum, *Roxb.* 236

Vern.—*Paddam, páya,* HIND.; *Chamiari, amalgach,* PB.; *Padma-kasta,* BOM; *Kongki,* LEPCHA.

Wild in the Himalaya, from the Indus to Assam and the Khásia Hills. It yields an abundant gum, not used for any economic purpose.

It seems probable that it is the twigs of this plant which are sold in the medicine shops on account of the bark containing a small quantity of a substance resembling prussic acid.

PTEROCARPUS.

Pterocarpus indicus, *Willd.,* LEGUMINOSÆ. 237

Vern.—*Padauk,* BURM.; *Chalanga-da,* AND.

A lofty tree of Burma and the Andaman Islands.

Yields gum-kino. (*Kurz.*)

P. macrocarpus, *Kurz.* 23

Vern.—*Padauk,* BURM.

A deciduous tree of the Eng and upper mixed forests of Martaban and Tenasserim.

Yields a red resin, a sort of gum-kino (*Kurz.*)

P. Marsupium, *Roxb.* 239

Vern.—*Bíja, bijasár, sálbia,* HIND.; *Asana,* MAHR.; *Byasa,* URIYA; *Vengai,* TAM.; *Yeggi,* TEL.

Found in Central and South India, extending northward to the Banda district of the North-West Provinces.

It yields the red gum-resin called "Kino"—a valuable astringent, much used in medicine. The Malabar Kino was sent from Madras to the Punjab Exhibition. This is an astringent extract which practically should not be classed with gums and resins. The juice is extracted when the tree is in blossom by making longitudinal incisions in the bark, The juice is collected in a receiver and dried. The hardened juice consists of blackish-red, angular, pea-like grains, partially soluble in water, but almost entirely in spirits of wine. It is used medicinally, and might be used as a source of tannin if sufficiently cheap.

PUNICA.

Punica Granatum, *Linn.,* LYTHRACEÆ. 240

THE POMEGRANATE; GRANADES, *Fr.*; GRANATS, *Ger.*

Vern.—*Anár, dárim,* HIND.; *Dálim,* KUMAUN; *Shajratur-rumman.* ARAB.; *Darakhte-nar,* PERS.; *Anár,* DEC.; *Dalimba,* MAHR; *Madalaich, chedi,* TAM.; *Danimma-chettu,* TEL.; *Thalé,* BURM.

A small tree, wild in the Sulaiman Range (altitude 3,000 to 6,000 feet), and the Salt Range; cultivated in most parts of India and Burma.

Pwenyet or Poonyet. 241

Pwenyet or Pwainget, sometimes called BLACK DAMMAR.

A honeycomb black resin, met with in Burma, formed by a Hymenopterous insect (**Trigona laeviceps**). This insect seems to obtain the resinous matter from the following plants: **Hopea odorata,** *Roxb.*, the *Thingan* of Burma; **Dipterocarpus lœvis, turbinatus**, *Gærtn.* (=**laevis**, *Ham.*), the WOOD-OIL TREE, the *Kanyengnee;* and **Canarium bengalense,** *Roxb.;* and probably also from **Shorea obtusa,** *Thitya,* which exudes a white resin.

It must, however, obtain its resinous supply chiefly from the first two of these, as the others are not common. It constructs its hive in the hollows or bifurcations of trees, the crevices of rocks, or on the ground. A trumpet-shaped entrance is constructed of the resinous matter, protruding often for about a foot in length, and gracefully widening to about the same extent. To obtain the hive, the trees have, in the majority of cases, to be hewn down, each yielding about 4 lbs. The principal use of **Poon-yet** is for caulking boats, for which purpose it is mixed with earth-oil or petroleum. It is first boiled in water; thereafter it is kneaded with petroleum until it attains the consistency of *putty.*

Specimens of this resin, and also a perfect hive, should, if possible, be procured from Burma, together with all the *Dammar* resins met with in Burma.

RHUS.

242 **Rhus succedanea,** *Linn.*, ANACARDIACÆ.

Vern.—*Tatri, arkol, nurku,* PB.; *Raniwalai,* NEPAL; *Serknyok,* LEPCHA.

Himalaya, from the Jhelam to Assam, and the Khásia Hills.

The seeds yield a pure white wax, made into candles in Japan.

The stems of this and also **R. varnicefera** are in Japan and China scratched at the age of 4 or 5 years. From these incisions an exudation is obtained which constitutes the varnish used in Japanese and Chinese lacquer work.

SACCOPETALUM.

243 **Saccopetalum tomentosum,** *Hook. f., & T. T.*, ANONACEÆ.

Vern.—*Kirna, karri,* HIND.; *Hoom,* BOM.; *Chilkadudu,* TEL.

Oudh and Gorakhpur, Behar, Central India and the Western Ghâts.

A large tree with straight stem; bark an inch thick; leaves used as fodder.

It yields a gum belonging to the false tragacanth or hog-gum series.

SAGABENUM.

244 **Sagabenum** or **Sagapenum** or in the older writers **Serapinum.**

Iskabena is a Persian name for a gum-resin occurring in small, rounded or oblong pieces, of a yellowish-brown colour, supposed to be derived from a species of **Ferula.** The Persian article is quite distinct from the Levant **Sagapenum.** Specimens and further information should be obtained from Bombay.

SAPINDUS.

245 **Sapindus Mukorossi,** *Gaertn.*, SAPINDACEÆ.

Syn.—S. DETERGENS, *Roxb.*

Vern.—*Ritha, dodan, kanmar,* HIND.

Cultivated throughout North-West India and Bengal.

A gum obtained from this tree was sent by the Madras Forest Department to Amsterdam.

Sapindus trifoliatus, *Vahl.* 246

THE SOAP-NUT TREE.

Syn.—S. EMARGINATA, *Vahl.*

Vern.—*Ritha,* HIND., MAHR.; *Bara ritha,* BENG.; *Pounanga,* TAM.; *Puvella,* CINGH.

Often cultivated in Bengal, South India, and Ceylon.

It yields a gum. The fruits (*Ritha*) are largely used for washing silk.

SCHLEICHERA.

Schleichera trijuga, *Willd.*, SAPINDACEÆ. 247

Vern.—*Kosum, gausam,* HIND.; *Púskú,* TEL.; *Pává,* TAM.; *Kusumb,* MAHR.; *Gyo,* BURM.

A large deciduous tree of the Sub-Himalayan tract from the Sutlej eastward, Central and South India, and Burma.

Exudes a yellowish resin. Lac is produced on the tree. (*Kurz.*)

SCORODOSMA.

Scorodosma fœtidum, *Bunge,* UMBELLIFERÆ. 248

This is supposed to be the source of the commercial Asafœtida of commerce, which reaches Bombay from Afghanistan. It seems probable that the Persian supply of this substance is obtained from **Ferula Narthex,** *Boiss.*, which see.

SEMECARPUS.

Semecarpus Anacardium, *Linn., f.* ANACARDIACEÆ. 249

MARKING-NUT TREE.

Vern.—*Bhilawa, bheyla,* HIND.; *Bhela, bhelatuki,* BENG.; *Bibbá,* MAHR.; *Shaing,* TAM.; *Jiri,* TEL.; *Chyai beng,* BURM.

Sub-Himalayan tract from the Sutlej eastward to Assam and Chittagong, but not to Burma; ascending 3,500 feet in altitude.

The tree yields a gum, a sample of which has been sent by the Madras Forest Department to the Amsterdam Exhibition. **Brandis** says that "the pericarp is full of an acrid juice which is used in native medicine. A black varnish is made from it, and, mixed with lime water, it is used for marking linen."

S. panduratus, *Kurz.* 250

Vern.—*Che,* BURM.

A tree of Pegu and Martaban.

Yields a black resin. (*Kurz.*)

S. travancorica, *Bedd.* 251

Vern.—*Natu sengote,* TAM.

A tree of the Tinnevelly and Travancore Hills.

It abounds with the same caustic black juice as the preceding.

SESBANIA.

Sesbania grandiflora, *Pers.*, LEGUMINOSÆ. 252

Syn.—ÆSCHYNOMENE GRANDIFLORA, *Roxb.*; AGATI GRANDIFLORA, *Desv.*

Vern.—*Basna,* HIND.; *Buka, bak,* BENG.; *Shevari, agasta,* MAHR; *Agati,* TAM.; *Avesi,* TEL.; *Páukpan,* BURM.

Cultivated throughout India and Burma, a doubtful native.

A handsome small tree with pink or white flowers. It is said to yield scantily a dark-coloured gum resembling Kino; the bark is very astringent.

SHOREA.

253 **Shorea nervosa,** *Kurz*, DIPTEROCARPEÆ.

A Tenasserim species, yielding a clear yellowish resin of the qualities and smell of Colphony. (*Kurz.*)

254 **S. obtusa,** *Wall.*

Vern.—*Thi'ya*, BURM.

A large tree of the Eng forests of Burma.
Exudes white resin.

255 **S. robusta,** *Gaertn.*

THE SÁL TREE.

Vern.—*Sál, sákoh, sála, sakhu, salwa,* HIND.; *Bolsal,* GARO; *Teturl,* LEPCHA; *Sakwa,* NEPAL; *Koroh,* OUDH; *Gúgal,* TEL.

North-east moist and intermediate zones: Sub-Himalayan tract, from the Beas to Assam; eastern part of Central India, from the Ganges to the Godavari, extending westward to the longitude of Mandla, with an outlying patch on and around the sandstone hills of the Pachmari Range.

A large, gregarious tree, often covering certain interrupted tracts, without the existence of connecting patches. Very abundant in Chutia Nagpur, and often associated with the Mahúa.

The tree, when tapped, exudes large quantities of whitish aromatic resin, used in native medicine; also as an incense, and to caulk boats. It occurs in small rough pieces, from a pale creamy colour to a dark brown, nearly opaque, and very brittle. "In some places in the upper Teesta forests, large pieces, often 30 to 40 cubic inches in size, are found in the ground at the foot of the trees." (*Gamble.*) It has no taste or smell, to a small extent soluble in alcohol, almost entirely so in ether, and perfectly so in turpentine and the fixed oils. It is chiefly used as a substitute for dammar by boat-builders.

In Bombay the resin is called *Rál*. There are several resins bearing this name; Dymock regards the one obtained from this plant as the true *Rála* of the Sanskrit writers.

The conservation of the sál forest has put a stop to the practice of notching the trees and thereby made the supply of sál resin in large quantities quite improbable. Dr. Dymock informs me that Bombay is supplied with *rál* from Singapore; it is probably from the Eastern Archipelago, and is imported in large quantities. It occurs in large stalactitic masses, of a pale creamy colour to yellowish brown, nearly opaque. This is a remarkable fact, incalculable quantities of this most useful gum are allowed to go to waste in the forests at our very door, compelling us to import our supply from the Straits. It would thus seem that we have deprived a large community of a former source of subsistence and driven the supply of the natural products of the forests to other countries.

Shorea siamensis, *Miq.* 256

Syn.—PENTACME SIAMENSIS, *Kurz.*

Vern.—*Ingyin,* BURM.

Common in the *In* forests of Burma, especially in those of Ava and Prome.

It yields a red resin.

S. Tumbuggaia, *Roxb.* 257

Syn.—VATICA TUMBUGGAIA, *W. & A.*

Vern.—*Cangú, congo, tumbugai,* TAM.; *Thambá,* TEL.; *Vanboga,* MALAYAN.

Cuddapah and North Arcot districts.

It yields a *Dammar,* which is used as a substitute for pitch. (*Gamble.*)

SKIMMIA.

Skimmia Laureola, *Hook. f.,* RUTACEÆ. 258

Vern.—*Kedar-patti* (*Gangotri*), *Ner, barru,* PB.; *Nehar, gurl pata,* KUMAUN; *Chumlani,* NEPAL; *Timburnyok,* LEPCHA.

An extremely aromatic shrub found throughout the temperate Himalaya from Marri to Mishmi, altitude 6,000 to 10,000 feet; Khásia Mountains, altitude 5,000 to 6,000 feet.

The leaves are burnt as incense. (*J. F. Duthie.*)

SOYMIDA.

Soymida febrifuga, *Adr. Juss.,* MELIACEÆ. 259

THE INDIAN RED WOOD.

Vern.—*Rohan,* HIND.; *Rohina,* BENG.; *Shem,* TAM.; *Sumi,* TEL.

A large deciduous tree of Central India and Deccan.

The deep red bark is half an inch thick, very astringent and used in native medicine; it contains a gum.

SPATHOLOBUS.

Spatholobus Roxburghii, *Benth.,* LEGUMINOSÆ. 260

Syn.—BUTEA PARVIFLORA, *Roxb.*

Vern.—*Mala, mulu, maula,* HIND.; *Debrelara,* NEPAL; *Tetrobrik,* LEPCHA; *Pauknwé,* BURM.

Sub-Himalayan tract from the Jumna eastward to Bengal, and Burma.

This plant exudes a red gum, resembling " Kino."

SPONDIAS.

Spondias mangifera, *Pers.,* ANACARDIACEÆ. 261

THE HOG PLUM.

Vern.—*Amra, amara, ambodha,* HIND.; *Amna,* BENG.; *Tongrong,* GARO; *Rán-amba,* MAHR.; *Kat máa,* TAM.; *Aravi mamádi,* TEL.; *Gwe,* BURM.

Found growing in the Sub-Himalayan tract, ascending to 3,000 feet in Sikkim; in the dry forests of South India and Burma; rare in Central India.

It yields a gum, somewhat resembling gum-arabic, but darker in colour. A sample was supplied by the Madras Forest Department to the Punjab Exhibition.

SPONIA.

262 **Sponia orientalis,** *Planch.*, URTICACEÆ.

Syn.—CELTIS ORIENTALIS, *Linn.*

Vern.—*Badu manu,* C. P.; *Kooail,* NEPAL; *Jupong,* ASS.; *Mini,* TAM.; *Gada-nelli,* TEL.; *Gorklu,* KAN.

Himalaya, from Nepal eastward; Bengal, Burma, Central and South India. A small rapid-growing tree.

The coarse amphak cloth of Assam is made of this tree. The bark yields a fibre and a gum.

STERCULIA.

263 **Sterculia urens,** *Roxb.*, STERCULIACEÆ.

Vern.—*Gúhú, kúlú, gúlar,* HIND.; *Odla,* ASS.; *Kalru,* AJMIR; *Pándrúka, kávalí,* MAHR.; *Karai,* GUZ.; *Vellay pútali,* TAM.; *Talbsu,* TEL.

Sub-Himalayan tract from the Ganges eastward, common in forests throughout India and Burma.

It yields a gum called *Katila* or *Katíra.* This belongs to the pale or Tragacanth series. It is inferior but is issued to the Government hospitals in Bombay instead of Tragacanth. It has been repeatedly valued in Europe, and has been pronounced worth only some 20 shillings a cwt.

Dr. Dymock, however, informs me that under the name of *Karai-gond* it is largely used in Bombay in the manufacture of native sweetmeats.

264 **S. villosa,** *Roxb.*

Vern.—*Udal, udar,* HIND.; *Gul-bodla,* PB.; *Vake-nar,* TAM.

Sub-Himalayan tract, from the Indus eastward; common in forests throughout India and Burma.

It yields a white pellucid gum, exuding freely from scars on the bark. It resembles the preceding, and, like it, is at present commercially valueless. It is only slightly soluble and has no adhesive properties.

STEREOSPERMUM.

265 **Stereospermum suaveolens,** *DC.*, BIGNONIACEÆ.

Vern.—*Páral, padal, padiálu* HIND., MAHR.; *Parlú,* BENG.; *Parari,* NEPAL; *Padri,* TAM.; *Kala-goru,* TEL.

Sub-Himalayan tract, from the Jhelam eastward, ascending to 4,000 feet; Bengal, Burma, Central and South India.

The root and the bark are used in native medicine as a cooling decoction.

The bark yields a gum, one of the dark-coloured Hog or Tragacanth series.

STYRAX.

266 **Styrax Benzoin,** *Dryand,* STYRACEÆ.

Vern.—*Lubán,* HIND. (*Luban* is more properly applied to **Olibanum**).

Grows in the Malay Archipelago.

Yields the true "Gum Benzoin," which is used in medicine, in perfumery, and in the composition of incense. It is produced by incisions into the bark, and it occurs in lumps of small masses of tears, or of a brownish mass with or without tears. It has an agreeable odour, and is soluble in rectified spirit and in solution of potash. It contains from 76 to 80 per cent. of resin, a volatile oil, and an acid known as benzoic acid. The whitish varieties are generally used for medicinal purposes, being used chiefly in pulmonary complaints. It is burnt as an incense by the Roman Catholics, Buddhists, and Hindús in their worship. The smoke it gives out acts as a disinfectant and drives away mosquitoes and sandflies.

Two kinds of Benzoin are met with in the London market, *viz.*, Siam Benjamin and Sumatra Benjamin. (*Dymock.*)

Styrax officinale, *Linn.* 267

A native of the Levant, Asia Minor and Syria.

Yields the resin "Storax." This is a solid substance somewhat resembling Benzoin. This pleasant and fragrant substance has been a favourite from the days of Dioscoroides and Pliny. It has practically been exterminated. The young twigs do not yield the resin, and where met with the plant has been ruthlessly lopped, and thereby reduced to a bush. The resin Storax is now practically unknown. Liquid Storax, *see* **Liquidambar orientalis,** *Miller.*

S. serrulatum, *Roxb.* 268

Vern.—*Kum-jameva,* BENG.; *Chamo,* LEPCHA.

A small tree of Eastern Bengal, Sikkim, and Chittagong.

Yields gum.

S. virgatum, *Wall.* 269

A small tree of Eastern Bengal.

Yields gum, like Benjamin or Benzoin, of inferior quality.

SWIETENIA.

Swietenia Mahagoni, *Linn.*, CEDRELACEÆ. 270

Cultivated in Bengal and as far north as Saharanpur; a native of Jamaica and Central America. Originally introduced into India in 1795 but not propagated to any extent until 1865, when **Dr. Anderson** sowed 8,000 seeds, from which 460 plants were obtained. These were planted in the Darjiling forests and in Bengal, the latter succeeding well.

Is said to yield abundance of a superior silvery-looking gum.

TAMARINDUS.

Tamarindus indica, *Linn.*, LEGUMINOSÆ. 271

Vern.—*Amli, ambli, imli,* HIND.; *Tintiri, tentul,* BENG.; *Chincha,* MAHR.; *Puli,* TAM.; *Chinta,* TEL.; *Karangi,* MYSORE; *Magyi,* BURM.

Cultivated throughout Burma and India as far north as the Jhelam.

TAMARIX.

272 **Tamarix articulata,** *Vahl.*, TAMARISCINEÆ.

Vern.—*Farás, farwa, narlei,* PB.; *Asrelei,* SIND.

Found along rivers and the sea-coast, almost throughout India.
Yields a small quantity of gum.

273 **T. dioica,** *Roxb.*

Vern.—*Lal jhau,* BENG.; *Jhau,* HIND.; *Lei, pilchi,* PB.; *Gaz, láo,* SIND.

Found along rivers and the sea-coast, almost throughout India.

It yields a gum which appears nodular, transparent in the central speck of each tear, and opaque on the circumference.

TAXUS.

274 **Taxus baccata,** *Linn.*, CONIFERÆ.

Vern.—*Birmi,* KASHMIR; *Tcheiray gulab,* NEPAL; *Sarap badar,* AFG.

Himalaya, from the Indus to Bhutan, and the Khásia Hills.

The gummy exudation forms a portion of the incense used in Tibet.

TECTONA.

275 **Tectona grandis,** *Linn.*, VERBENACEÆ.

THE TEAK TREE.

Vern.—*Ságun,* HIND.; *Singuru,* URIYA; *Sáj, sal,* ARAB., PERS.; *Tekku, tek,* TAM.; *Teku,* TEL.; *Jádi, téga,* KAN.; *Játi,* MAL.; *Kyún,* BURM.

Found in Central and South India and Burma.

This is the most important timber tree of India and Burma, used for ship-building, railway sleepers, carpentry and furniture. The wood yields an oil, which is used medicinally, and from the bark a gum is said to exude.

Mr. G. E. Evans is of opinion that the wood-tar from this tree contains all the substances that are present in coal-tar, but in different proportions. If used like coal-tar, it would produce much less permanent effects.

TERMINALIA.

276 **Terminalia Arjuna,** *Bedd.*, COMBRETACEÆ.

Vern.—*Anjan, arjun, arjuna,* HIND.; *Arjun,* BENG.; *Vella marda,* TAM.; *Arjun,* MAHR.; *Yermaddi,* TEL.; *Taukkyan,* BURM.

Sub-Himalayan tract, Oudh, Bengal, Burma, Central and South India.

It yields a brown translucent gum.

277 **T. belerica,** *Roxb.*

Vern.—*Bahera, bhaira, behara,* HIND.; *Bahera,* BENG.; *Babela,* PERS.; *Yelá,* MAHR.; *Tani,* TAM.; *Tani,* TEL.; *Thitsein,* BURM.

Sub-Himalayan tract from near the Indus eastward; the forests of India and Burma.

It yields copiously a gum which, apparently, is of no economic use.

Terminaia Chebula, *Retz.* 278

Vern.—*Harra, harara,* HIND.; *Haritaki,* BENG.; *Hiradá,* MAHR.; *Kadakoi,* TAM.; *Karaka,* TEL.

Sub-Himalayan tract, from the Sutlej eastward; Bengal, Assam, Chittagong, Central and South India.

Yields a gum.

T. tomentosa, *W. & A.* 279

Vern.—*Saj, sein, asan, assain, asna,* HIND.; *Piasal, asan,* BENG.; *Karra, marda,* TAM.; *Maddi,* TEL.; *Taukkyan,* BURM.

Sub-Himalayan tract, from the Ravi eastward, ascending in some places to 4,000 feet; Bengal, Central and South India, and Burma.

It yields a brown gum.

THESPESIA.

Thespesia populnea, *Corr.,* MALVACEÆ. 280

THE PORTIA OR TULIP TREE.

Syn.—HIBISCUS POPULNEUS, *Willd.*

Vern.—*Parsipu,* HIND.; *Poresh,* BENG.; *Poris,* TAM.; *Gangarayu,* TEL.; *Bendi,* GUZ.; *Sureya,* CINGH.

It is found in the coast forests of India, Burma, and the Andaman Islands. Planted throughout India.

Said to yield a gum, which was sent from Madras to the Punjab Exhibition, and which is probably the yellow milk of the capsules dried.

Tragacanth. 281

A gum obtained from several species of **Astragalus,** inhabiting South Europe, Asia Minor, and Persia.

Used in the arts as a substitute for glue. It is of a dull white colour, translucent, inodorous, and tasteless. In India the following gums are used as substitutes for Tragacanth:—

Cochlospermum Gossypium,

Sterculia urens, and

Hog Tragacanth, the produce of **Prunus Amygdalus,** imported into Bombay from Persia.

TRICHOSANTHES.

Trichosanthes cucumerina, *Linn.,* CUCURBITACEÆ. 282

Vern.—*Jangli-chachinda,* HIND.; *Ban-patol,* BENG.; *Parula,* MAHR.; *Pipudel, pudel,* TAM.; *Chyad-potla,* TEL.

A gum said to be from this plant was sent from Madras to the Punjab Exhibition. This seems doubtful; specimens in confirmation much required.

Turpentine. 283

An oleo-resin, obtained chiefly from various species of **Coniferæ.** Several turpentine oleo-resins are also obtained from **Anacardiaceæ,** of which may be mentioned the Chian or Cyprian Turpentine. *See* **Pinus** and **Pistachia.**

URCEOLA.

284 **Urceola elastica,** *Roxb., and* **U. esculenta,** *Benth.*, APOCYNACEÆ.

Vern.—*Kyetpaung*, BURM.

An extensive, woody climber in the forests of Tenasserim and Pegu. Recently **Mr. G. W. Strettell** has experimented with this plant as a supplier of caoutchouc, and it seems likely to become useful. Specimens of the rubber much required; also further information.

285 **Varnish.**

Various substances used in solution with spirit, or in the natural condition, or liquified by heat. Of the commercial varnishes the following may be mentioned as the more important in use:—

1st.—Lac or Spirit Varnish, *see* **Lac.**

2nd.—Burmese Varnish, **Melanorrhœa usitata,** which see.

3rd.—Cingalese and Indian Varnish, **Semecarpus Anacardium,** which see.

4th.—Japanese Varnish, **Rhus succeedanea,** which see.

5th.—Doon Varnish, **Doona Zeylanica,** which see.

VATERIA.

286 **Vateria indica,** *Linn.*, DIPTEROCARPEÆ.

THE WHITE DAMMAR of South India, or PINEY VARNISH, or INDIAN COPAL.

Vern.—*Kahruba* or *sandras*, HIND.; *Rál*, BOM.; *Pineymaram*, TAM.; *Dupa maram*, KAN.; *Dupadu*, TEL.; *Hal*, CINGH. (See also **Shorea robusta.**)

Western moist zone; Western Ghâts, from Kanara to Travancore, ascending to 4,000 feet.

On wounding the tree the resin known as the *Peini* or *Piney Dammar* is obtained. **Dr. Bidie** reports that under the influence of gentle heat it combines with wax and oil, and forms an excellent resinous ointment.

Dr. Dymock, in his *Materia Medica of Western India*, says: "*Rál* is imported into Bombay from Singapore in casks and bales, value R6 per cwt." It forms an excellent varnish resembling Copal. It is also burnt as a candle, giving off smoke with a pleasant smell. Specimens vary in colour, denseness, and fragrance. Some are of a light-greenish colour, homogeneous, vitreous on fracture, while others are of a yellow amber colour and vesicular.

VATICA.

287 **Vatica lanceæfolia,** *Blume.*

Vern.—*Morhal, Moal*, SYLHET; *Panthityu*, BURM.

A large tree of Eastern Himalaya, Assam, East Bengal, Chittagong, and Burma.

Produces the Ghund of the Brahmins, a strong-smelling balsam. (*Kurz.*)

VENTILAGO.

288 **Ventilago madraspatana,** *Gærtn.* RHAMNEÆ.

Vern.—*Raktapita*, BENG.; *Lokandi*, BOM.; *Papli*, TAM., KAN.; *Yerra chiculli*, TEL.; *Chorgu*, HYDERABAD.

Central and South India and Burma.

It is said to yield a gum.

WILLOUGHBEIA.

Willoughbeia edulis, *Roxb.*, APOCYNEÆ. 289

Vern.—*Lutiam*, BENG.

A large climber of the forests of Chittagong with edible fruits. It yields a form of Caoutchouc, which see.

W. martabanica, *Willd.* 290

A native of Tenasserim. Said to also yield caoutchouc.

WOODFORDIA.

Woodfordia floribunda, *Salisb.*, LYTHRACEÆ. 291

Syn.—GRISLEA TOMENTOSA, *Roxb.*

Vern.—*Dáwi, dhaula, dhaura, santha,* HIND.; *Dhewti,* OUDH; *Dahir,* NEPAL; *Jatiko,* URIYA; *Dhauri,* BOM.; *Jargi,* TEL.; *Phulsatti,* MAR.

Common throughout India, ascending to 5,000 feet in the Himalayas.

Balfour says the gum of this plant is collected largely in Harauti and Mewar. It appears to resemble gum tragacanth and to swell in water. Specimens required for examination.

Wood-oil. *See* **Gurjun** and the various species of **Dipterocarpus.** [171] [117-122]

WRIGHTIA.

Wrightia tinctoria, *R. Br.*, APOCINACEÆ. 292

Vern.—*Dudhi,* BANDA; *Pálá,* TAM.; *Tedlapál,* TEL.; *Kala kudu,* MAR.

Rajputana, Central and South India.

XYLIA.

Xylia dolabriformis, *Benth.*, LEGUMINOSÆ. 293

IRONWOOD TREE OF PEGU.

Syn.—Mimosa xylocarpa, *Roxb.*

Vern.—*Jambu,* HIND.; *Boja,* URIYA; *Irul,* TAM.; *Konda tangedu,* TEL.; *Pyinkado,* BURM.; *Jambe,* KAN.

Chanda District, South India, Arracan, Burma.

It yields a red resin.

ZIZYPHUS.

Zizyphus Jujuba, *Lamk.*, RHAMNEÆ. 294

Vern.—*Bér, baer,* HIND.; *Kul, bér,* BENG.; *Bora,* MAHR.; *Zin,* BURM.; *Rengha, regi,* TEL.; *Yellande,* TAM.; *Yelchi,* KAN.

Cultivated throughout India and Burma.

Said to yield gum.

Z. nummularia, *W. & A.* 295

Vern.—*Malla, bér, jhari, kanta,* N.W.P.; *Nundo-jangro,* SIND.; *Parpalli,* KAN.; *Karkanna,* AFG.

Drier parts of North-West India and the Deccan.

Said to yield a gum.

296 **Zizyphus rugosa,** *Lamk.*

Syn.—Z. LATIFOLIA, *Roxb.*

Vern.—*Dhaura,* OUDH; *Suran,* C. P.; *Rukh baer,* NEPAL; *Torana,* MAHR.

Sub-Himalayan tract, from the Ganges eastward; Burma, Central and South India.

Said to yield gum.

297 **Z. vulgaris,** *Lamk.*

Syn.–Z. FLEXUOSA, *Wall.*

Vern.—*Sinjli, simli, ban,* HIND.

A shrub or small tree of the Punjab, ascending to 6,000 feet in altitude; cultivated in Bengal.

Said to yield gum.

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PART II.

DYES, TANS, AND MORDANTS.

ECONOMIC PRODUCTS OF INDIA

EXHIBITED AT THE

Calcutta International Exhibition, 1883-84.

PART II.—Dyes, Tans, & Mordants.

ABIES.

Abies Webbiana, *Lindl.*, CONIFERAÆ. 1

Vern.—*Paludar, rewari*, JHELAM; *Búdar*, KASHMIR; *Rag, re, tosh, spun, pun*, HIMALAYAN NAMES.

A lofty, evergreen tree found on the Himalaya, from the Indus to Bhutan, altitude 7,000 to 13,000 feet.

Mr. **Duthie**, Superintendent Botanic Gardens, Saharanpur, has drawn my attention to the fact that **Veitch** in his *Manual of Coniferæ*, states that "a beautiful violet dye is extracted from the young cones" of this plant. It is remarkable that neither **Stewart**, **Brandis**, nor **Gamble** allude to this dye, while in *Gordon's Pinatum* occurs the following: "It is called *Rai-sulla* (fragrant fir) and *Gobrea-sulla* (fragrant or indigo fir) by the Gorkhalis on account of an indigo or purple pigment being extracted from the young cones." It would be exceedingly interesting to have this dye properly confirmed by first information and specimens of the dye stiff or cloths dyed by this process.

Abir, or the white perfumed powder which is mixed with the red *Gulal* powder and used at the *Holi* festival. 2

1st.—The Bengal *Holi* powder is prepared from **Curcama Zedoaria**, *Roscoe*, and sappan wood. Dr. **McCann** publishes from the records of the Bengal Economic Museum as the practice adopted in Mymensing in his *Dyes and Tans* the following description:—

> "The *shati* is washed and pounded in a *dheuki*. The powder is then put into an earthen vessel full of water and allowed to rot. The water is afterwards poured off, and the powder is dried. It is then mixed with the juice extracted from bakram wood. This turns it red, and it is called *Abir* or *holi* powder. *Shati* is gathered for this purpose in the month of *Poos* (December-January.)"

The practice which seems to prevail in most other parts of India is to prepare the two powders quite distinct from each other and to mix them as required. Dr. **Dymock** has favoured me with the following list of *Abir* powders:—

2nd.—A whitish *Abir* made from the following:—

Andropogon muricatus.
Hedychium spicatum.
Cæsalpinia Sappan.
Sorghun vulgare (flour.)

3rd.—The buff-coloured Hindi *Gulal* known as *Ghisi* contains, in addition to the above, the following:—

Cerasus (Prunus) Mahaleb.
Artemisi vulgaris.
Cedrus Deodara.
Curcuma Zedoaria.
Cloves.
Cardomums.

4th.—Deccan *Abir* or *Bukka* is of a black colour and in addition to all the above it contains the following:—

Aquillaria Agallocha.
Costus root (**Saussurea Lappa**), **C.B.C.**, formerly **Aucklandia Costus**, *Falc.*
Jatamansi.
Charcoal.

5th.—The *Abir* of the Jains is of a pale yellow colour. It is called *Vasat-shepa;* it is made of **Cæsalpinia Sappana.**

Carthamus tinctoria (saffron).
Musk.
Camphor.

Voight in his *Hortus Sub. Calc.* states that **Trapa bispinosa** (the Singara nut) is used as an *Abir.* "During the *Holi* festival a red dye is made of it mixed with the yellow dye procured from the flowers of **Butea frondosa.** **Drury** quotes this paragraph without acknowledgment, but I can find no other mention of this, and presume the flour of the Singara nut is simply used in place of flour being coloured with the *gulal.*

ACACIA.

3 **Acacia arabica,** *Willd.*, LEGUMINOSÆ.

THE INDIAN GUM ARABIC TREE.

Vern.—*Bábúl, kikar,* HIND., BOM., PB.; *Báblá,* BENG.; *Babbar,* SIND.; *Karú-veylam,* TAM.; *Túma, nella túma,* TEL.

A small, thorny tree, common everywhere in India; cultivated in Pegu Division, Burma.

The bark is a powerful astringent, and is one of the tanning substances most extensively used in India. There seems no good reason why this might not compete with the Australian Wattle-bark if once made properly known; its cheapness, as compared with the Wattle, would more than compensate for a slight inferiority in quality. The pods and the bark yield a brown or black dye, with alum as a mordant. **Balfour** says the legumes are used as a substitute for the more expensive dye-stuffs, and for communicating shades of drab. Salts of iron deepen the black dye. The seeds, pods, and leaves are also used in tanning, but more rarely than the bark. Leather tanned with bábúl is of a buff colour.

Acacia Catechu, *Willd.* 4

CATECHU, CUTCH, *Eng.*; CACHORE, *Fr.*

Vern.—*Khair, katha,* HIND., DEC.; *Khayer, kuth,* BENG.; *Khadira,* SANS.; *Khoira, koir,* ASS.; *Kashukatti, vodalai, karangalli, bágá, wodalior, kashu, katti,* TAM.; *Podala-manu, kanchu,* TEL.; *Kachu,* KAN.; *Sha,* BURM.

The Gum-resin Catechu is generally called *Kathá, kath,* HIND., BOM., BENG., PB.; *Katta-kambu,* TAM.; *Khadira,* SANS.

A tree, 30 to 40 feet high, abundant in the forests of India and Burma. It yields a valuable extract similar to Gambier; used as an astringent in medicine, and in dyeing and tanning. This is known as Gum Catechu; it possesses 45·55 per cent. of dark-coloured mimotannic acid. A solution of Catechu is, by the action of lime or of alum, changed into a dull red colour, which constitutes a fairly good dye, and is used for that purpose in some parts of India; the gum may be used or the heartwood broken up and boiled with the lime.

The bark is also used as a tan.

A. concinna, *DC.* 5

Vern.—*Rithá, kochi,* HIND.; *Ban-rithá,* BENG.; *Aila, rassaul,* OUDH; *Sikekai, shika,* BOM., DEC.; *Shaka,* TAM.; *Chikaya, gogu,* TEL.; *Sigé,* KAN.; *Kenbun,* BURM.

A climbing shrub found in South India, Bengal, Assam, and Burma. **Ainslie** first described the properties of the pods; they are largely used as a detergent, especially in washing the hair; they are also deobstruent and expectorant.

Balfour says the bark is used for dyeing and tanning fishing nets in South India.

Confirmation of this, and specimens, required.

A. decurrens, *Willd.* 6

The black or common Wattle-bark of Australia, now much used for tanning. It is being experimentally cultivated in India. *See* **Wattle-Bark.**

A. Farnesiana, *Willd.* 7

Vern.—*Vilayati kikar, vilayati bábúl, gú-kikar, gand-bábúl,* HIND.; *Gúya bábúla,* BENG.; *Guábábla,* BOM.; *Vedda vala,* TAM.; *Kusturi,* TEL.; *Fali,* KAN.; *Hnanlongyaing,* BURM.

A small, thorny tree or shrub with sweetly-smelling flower-heads known as Cassie in perfumery; common throughout India.

Christy, in his *New Commercial Plants,* includes the bark of this tree among the Indian tans. It is not much used in India, but is reported to be sometimes used in Dacca, mixed with salts of iron. It gives an inky dye. The pods are also used in some parts of Bengal as a dye-stuff. (*McCann.*)

A. Intsia, *Willd.* 8

Vern.—*Arhai-ka-bél,* SUTLEJ; *Katrar,* KUMAUN; *Harrari,* NEPAL; *Payir rik, ngraem rik,* LEPCHA; *Korinta,* TEL.

A large climber, met with on the outer Himálaya from the Chenab eastward, altitude 4,000 feet, and throughout the lower hills of India and Burma.

The bark or the fresh leaves of this plant are said to be used as an auxiliary or astringent in dyeing with MORINDA or LAC, giving brightness. (*McCann.*) The bark is also used as a substitute for soap to wash the hair. (*Gamble.*)

9 **Acacia leucophlœa,** *Willd.*

Vern.—*Rerú, raunj, karir, rohani, safed kikar,* HIND.; *Arinj,* RAJPUTANA; *Hewar,* MAR.; *Sharab-ki-kikar,* DEC.; *Raundra,* BANSWARA; *Vel-velam,* TAM.; *Harwar, tella-túma,* TEL.; *Bili jáli,* KAN.; *Tanaung,* BURM.

A tree met with in North, West and South India and Burma.

The leaves are used in dyeing, and give a black colour. The bark is also used for dyeing in Burma and gives a red colour, but mixed with other barks gives black. (*Prof. Romanis.*)

ACHYRANTHES.

10 **Achyranthes aspera,** *Linn.*, AMARANTACEÆ.

Vern.—*Latjirá, chirchirá, chirchitta,* HIND.; *Apáng,* BENG.; *Aghádá,* BOM.; *Apamarga,* SANS.; *Nai-yurur,* TAM.; *Titta-reni,* TEL.; *Kutri,* PB.; *Atkumah,* ARAB.; *Khare-vaskun,* PERS.

A shrub 3 to 4 feet; found all over India, ascending to 3,000 feet. A troublesome weed in gardens throughout the year.

The ashes of this plant are used as an alkali in dyeing.

ADENANTHERA.

11 **Adenanthera pavonina,** *Linn.*, LEGUMINOSÆ.

RED WOOD OR RED SANDAL WOOD.

Vern.—*Rakta-chandan, rakta kanchan, ranjana,* BENG.; *Thorali gunja,* MAHR.; *Ani kundamani,* TAM.; *Bandi gurivenda,* TEL.; *Manjadi,* KAN.; *Rechedá,* AND.; *Yweygyi,* BURM.

A small, deciduous tree met with in Bengal, South India, and Burma. Sometimes called RED SANDAL WOOD.

The wood is used as a dye.

ADHATODA.

12 **Adhatoda Vasica,** *Nees,* ACANTHACEÆ.

Vern.—*Arúsá,* HIND.; *Bákas, vasúk,* BENG.; *Adulasa,* MAHR.; *Arus,* SANS.; *Adhatodai,* TAM.; *Adasara,* TEL.; *Teeshæ,* NAGA; *Kath,* NEPAL.

A small, sub-herbaceous bush, often gregarious, found everywhere in Bengal, and in the Sub-Himalayan tract, ascending to 4,000 feet in altitude.

A yellow dye, obtained from the leaves by boiling, is used for dyeing coarse cloth. It gives a greenish-blue when combined with indigo. This property is not apparently known to the Nagas, who cultivate the plant to shade the approaches to their villages. I repeatedly asked if they prepared a dye from it, and was told that they did not, but that they used it for divining.

ÆGLE.

13 **Ægle Marmelos,** *Correa.*, RUTACEÆ.

THE BAEL FRUIT TREE.

Vern.—*Bél,* HIND., BENG. and BOM.; *Sriphal,* SANS.; *Vilva-pasham,* TAM.; *Bilva-pandu, maredu, patir,* TEL.; *Bilapatri,* KAN.; *Okshit,* BURM.

A small tree, found in cultivation all over India, often curiously sending up off-shoots from the roots, which in time become trees.

A yellow dye is obtained from the rind of the fruit; the unripe rind is also used along with myrabolans in calico-printing.

ALBIZZIA.

Albizzia Lebbek, *Benth.*, LEGUMINOSÆ. 14

Vern.—*Siris, siras, sirin, sirai, tantai, garso, kalsis,* HIND.; *Siris, sirisha,* BENG, MAHR.; *Suree,* SIND.; *Vaghe,* TAM.; *Dirasan, darshana,* TEL.; *Kal baghi, bengha,* KAN.; *Kokko,* BURM.; *Beymadá, gachodá,* AND.

A large, spreading tree, found wild or cultivated in most parts of India. The bark is used in tanning leather.

A. lophantha, *Benth.* 15

An Australian tree, now largely grown in India; naturalised on the Nilgiri Hills.

The bark may be used in tanning.

A. procera, *Benth.* 16

Syn.—MIMOSA ELATA, *Roxb.*

Vern.—*Safed siris, gurar, karo, gurbári, gurkur, garso,* HIND.; *Koroi,* BENG., ASS.; *Karallu, kini, kili,* BOM.; *Khili,* GÁRO; *Takmur,* LEPCHA; *Kanalu,* DEC.; *Konda vaghe,* TAM.; *Pedda-pattseru,* TEL.; *Búrdá,* AND.; *Sit,* BURM.

A large tree of the Himálaya, from the Jumna to Bengal, Central Provinces, Guzerat, South India and Burma.

The bark is sometimes used as a tan.

Algarobilla. 17

Tan obtained from an American species of the genus **Prosopis,** of which **P. pallida,** *Kunth,* is the most important. *See* **Prosopis.**

Alkalis or **Alkaline Ashes.** 18

These salts are largely used in India as mordants, but rarely in a pure form. They are derived from the ashes of many plants, chiefly the following:—

Abrus precatorius—Gunja, Kunch. See list of Medicinal Products.
[10] **Achyrantes aspera**—Apamárga, Apáng.
[12] **Adhatoda Vasica**—Vásaka.
Alstonia scholaris—Saptaparni, Chhátin.
Amarantus spinosa.
Anthroenemum indicum—*Moq.*
Bambu Ash.
Butea frondosa—Palása.
Cæsalpinia Bonducella—Pritika.
Caroxylon fœtidum—*Moq.*
„ **Griffithii**—*Moq.*
Calotropis gigantea—Arkâ, Akanda.
Cassia Fistula—Aragvadha, Sondâl.
Cedrus Deodara—*Davadáru.*
Euphorbia neriifolia—Snuhi.
Euphorbia Tirucalli—Lankasij.
Erythrina indica—Paribhadra, Pálitá-mádár.
Gmelina arborea—Gambhari.
Holarrhena antidysenterica—Kutja, kurchi.
Luffa ægyptiaca—Koshátaki.
Musa sapientum—Kadali, Kela.

Nerium odorum—Karavira.
Penicillaria spicata—Bájra.
Plumbago zeylanica—Chitraka.
Pongamia glabra—Karanja.
Salicornia brachiata—*Roxb.*
Shorea robusta—Asvakarna, Sál.
Stereospermum suaveolens—Pátalá, áral.
Suæda indica—*Moq.*
Suæda nudiflora—*Moq.*
Symplocos racemosa—Lodhra, lodh.
Vallaris dichotoma—Alsphota, happur-mali.
Vitex Negundo, *Linn, Samalú.*

Of minerals alum and *sájimáti* (a mixture of carbonate of potash and soda, found as a natural earth) are those most used.

See **Auxiliaries of Dyes.**

19 **Alkanet.**

The root of **Anchusa tinctoria** of China.

A red dye, much used in colouring liquids. The alkanet of Sikkim is obtained from **Onosma Hookeri**, *Clarke* (which see); Dr. Dymock informs me that a root is imported from Afghanistan as an alkanet which he thinks may prove a species of **Arnebia.**

ALNUS.

20 **Alnus nepalensis**, *D. Don.*, CUPULIFERÆ.

THE NEPAL ALDER.

Vern.—*Kohi*, PB.; *Udesh*, KUMAUN; *Udis, utis*, NEPAL; *Kowal*, LEPCHA.

A tall, sparsely-branched, deciduous tree, whose leaves soon become completely perforated by insects. It occurs from the Ravi eastward, between 3,000 and 9,000 feet in altitude, to the Khásia and Naga Hills.

The bark is used for dyeing and tanning. By the Nagas and Manipuris it is used in combination with **Rubia sikkimensis** and **R. cordifolia** to deepen the colour. See **Rubia.** It is also said to enter into the composition of native red inks. (*Stewart.*)

21 **A. nitida**, *Endl.*

Vern.—*Shrol, saroli, sawáli, chápu, raján, kúndash*, PB.; *Paya udesh*, KUMAUN; *Gira*, AFG.

A large tree, met with in the Punjab Himálaya.

The bark is used for dyeing and tanning.

ALOE.

Aloe vera, *Linn.*, LILIACEÆ.

INDIAN ALOE, *Eng.*; ALOES, *Fr.*; ALOE, *Germ.*

Syn.—A. BARBADENSIS, *Miller*; A. PERFOLIATA, *Roxb.*; A. VULGARIS, (*Bauhin*), *Lam.*

Vern.—*Ghikuwári, kumári*, HIND.; *Ghirta-kumári, girta-kunvár*, BENG.; *Ghirta-kumári, kanyá*, SANS.; *Sibr*, ARAB.; *Sibr, bole-siyah*, PERS.; *Eliya* (the resin) *kora-kand* (the plant); *komári*, DEC.; *Kanvár, kora kand, kora-phad*, SIND; *Kariya-polam, kattáli, kala-bunthæ*, TAM.; *Musham báram*, TEL.; *Mok*, BURM.

Mr. J. G. Baker, in the *Linnæan Society's Journal, Vol. XVIII,* *p. 176*, has established the synonyms above given, and formed under this species two varieties. **Bentley & Trimen**, in their *Medicinal Plants*, reduced all the names for the forms of this species to mere synonyms, under the name of **A. vulgaris**, *Lam.* I regard **Mr. Baker** as correct, and the varieties formed by him are well known to the natives of India.

Var. officinalis, sp., *Forsk.* 22

Syn.—A. RUBESCENS, *DC.*; A. INDICA, *Royle.*

Vern.—*Kumari*, HIND.; *Ghikawár*, N. W. P.; *Ghirta-kanvár*, BENG.; *Sirrughá*, *kuttalay*, TAM. (*see Ainslie*); *Nabatussibr*, *áúlsi*, ARAB.; *Dura-khte-síbr*, PERS.

This is the form met with in a semi-wild condition in Bengal and the North-West Provinces. It has beautiful reddish and orange flowers, with the bases of the leaves purple-coloured and so dilated as to have in all probability suggested the name **A. perfoliata.**

Var. littoralis, sp., *Koenig.* 23

Vern.—*Chhótá-rakus-pattah*, *chhotá-kanvár*, HIND., DEC.; *Chhetá-jangli-ánanash*, BENG.; *Shiru-katrásh-ai*, TAM.; *Chinna-kalabanda*, TEL.; *Dhákutá kunvára*, BOM.; *Náni-komári*, GUZ. **U. C. Dutt** says that this plant was not known to the Sanskrit authors, but **Ainslie** gives it the Sanskrit name of *kümari.*

This is altogether a much smaller form, having yellow flowers in simple spikes, with the bases of the leaves not half so broad as in the preceding, and always of a pale green colour. It has become quite naturalised on the coast of the south of the Madras Presidency.

In *Spon's Encyclopædia* there occurs an account of the preparation of the dye "Chrysammic Acid." It is prepared by heating 8 parts of nitric acid with 1 part of Aloes. After the violent action has subsided, a second proportion of Aloes is added to the mixture until the fumes of Hyponitric acid subside. The mass is then poured into water, when Chrysammic flakes settle in the bottom of the vessel. These are washed several times in water. The crystals change their colour under varying circumstances, giving a purple colour to silk, black to wool, and pink to linen. A French firm has recently used it to give a beautiful brown, known as vegetable brown, which is produced through the agency of sulphuric acid. This dye is bright; it resists strong alkaline action; it combines with most of the anilines and other dyes, economizing them and rendering them thoroughly fast; and it is not expensive.

It would be exceedingly interesting to know if the existence of this dye is known to the cultivators of the Indian Aloes, and if it has ever been extracted in India. As the uses of this dye will probably be greatly developed, it seems desirable to make the process of preparation known.

Information, and specimens of this dye, much required.

ALPINIA.

Alpinia Galanga, *Sws.*, SCITAMINEÆ. 24

THE GREATER GALANGALE, *Eng.*; GALANGA *Port.*

Vern.—*Kulanján*, *külinjána*, *kara-kalijan*, or *kara-kulinján*, SANS., BEN., HIND.; *Péra-rattai*, TAM.; *Pedda-dumpa-rash-trakam*, TEL.; *Padagoji*, BURM.

A perennial plant native of Sumatra and Java, now cultivated in East Bengal and South India.

Mr. Buck says that this root-stock is imported into the North-West Provinces from the Punjab, and is used in calico-printing along with Myrabolans.

ALTHÆA.

25 **Althæa officinalis,** *Linn.*, MALVACEÆ.

THE MARSH MALLOW.

Vern.—*Gul khairo*, HIND. and BOM.; *Shemai-tuti*, TAM. The fruits are *Tukm-i-khitmé*, PERS. and BOM.; the roots *Resha-i-khitmé*, PERS. and BOM.

A native of Kashmir and the Punjab Himalayas.

Often cultivated in Indian gardens for its flowers, rarely for its dye, a rich blue, obtained from the leaves. **A. Rosea,** *Linn*, the HOLLY HOCK, yields the dye even more freely than **A. officinalis,** *L.*, and may also be used for the preparation of this dye and is met with plentifully in Kashmir.

Information as to whether this dye is actually prepared in India would be exceedingly interesting.

26 **Alum.**

Vern.—*Phitkari*, HIND.; *Phatkiri*, BENG.; *Sphatikári*, SANS.; *Pati-karam*, TAM., TEL. *Kyaukchin*, BURM.

The most common Indian mordant.

Information of existence in India or trade in this valuable salt would be most acceptable. **Mr. Buck** says it is imported into the N. W. Provinces from Calcutta, and is much used as a mordant in dyeing, especially with madder and turmeric.

"According to **Dr. Brandis** alum can be obtained from shale which exists in abundance in the Shwegyin District in Burma." *J. C. Hardinge, Esq., Secy., Agri-Horticultural Society, Rangoon.*

AMARANTUS.

27 **Amarantus spinosus,** *Willd*, AMARANTACEÆ.

Vern.—*Kántá-naté*, or *Kánta nutia*, BENG.; *Ránte-mat, rántemátha*, DEC.; *Mullukkirai*, TAM.

Dr. McCann, in his *Report on the Dye-stuffs of Bengal*, states that in Cuttack the ashes of this plant are used in dyeing with **Mallotus philippinensis.**

ANACARDIUM.

28 **Anacardium occidentale,** *Linn.*, ANACARDIACEÆ.

THE CASHEW NUT.

Vern.—*Kájú*, HIND., BOM.; *Hijali bádám*, BENG.; *Mundiri-kottai*, TAM.; *Jidimamidi*, TEL.; *Kempu gérus*, KAN.; *Thi-hothayet*, BURM.

A high tree, 30 to 40 feet; originally introduced from South America, now established in the coast forests of India, Chittagong, Tenasserim, and the Andaman Islands, and over South India.

The bark may be used for tanning. The pericarp gives an oil, called "Cardol," which is very astringent, and is used by the Andamanese to tan or colour fishing nets, so as to preserve them. **Dr. Dymock** informs me that this oil is called *Deek* in Goa, where it is much used as a tar for boats and nets.

ANOGEISSUS.

29 **Anogeissus acuminata,** *Wall.*, COMBRETACEÆ.

Syn.—CONOCARPUS ACUMINATA, *Roxb.*

Vern.—*Chakwa*, BENG.; *Panchi, pasi*, URIYA; *Numma*, TAM.; *Páchi mánu, pashi, pansi*, TEL.; *Phás*, MAR.; *Yón*, BURM.

A large, deciduous tree in some districts of Bengal, Orissa, South India, Chittagong, and Burma.

The leaves are used in Gamsur for tanning. (*Gamble.*)

Anogeissus latifolia, *Wall.* 30

Syn—CONOCARPUS LATIFOLIA, *DC.*

Vern.—*Dháwa, dháura, bakli,* HIND.; *Dáurá,* MAHR.; *Gólra, goldia, dhokri dau,* RAJPUTANA; *Vellay naga, namme,* TAM.; *Sherimanu, cherimán, tirman,* TEL.; *Dohu,* URIYA; *Dháaori, dandua,* MAR.; *Dinduga, bejalu,* KAN.; *Arma,* GOND.

A denizen of the Himálayan forests and of those of South India; a tall, handsome tree.

It yields a gum, used by calico-printers. **Dr. Dymock** informs me that the leaves are in Bombay used as a tan. They were analysed by **Dr. Lyon** and were found to contain as much tannin as those of the *Sumach* tree **Mr. Duthie** reports that they are also used as a tan in the N. W. Provinces.

ANONA.

Anona reticulata, *Linn.,* ANONACEÆ. 31

THE BULLOCK'S HEART.

Vern.—*Nona,* BENG.; *Rámphal,* DEC.; *Rámsitá,* TAM.; *Rámchettu,* TEL.

A small tree, wild in some parts of India, but widely cultivated; occurring everywhere in Bengal, Burma, and South India.

The dry, unripe fruit yields a black dye, and the fresh leaves a fairly good quality of indigo.

Aporosa villosa, *Bail.,* EUPHORBIACEÆ. 32

The bark is used as a red dye. *See* **Gums and Resins.**

ARECA.

Areca Catechu, *Linn.,* PALMÆ. 33

THE ARECA or BETEL-NUT PALM.

Vern.—*Supári,* HIND.; *Supári, guá,* BENG.; *Gubák,* SANS.; *Kottai-pakka,* TAM.; *Poka vakka,* TEL.; *Kun, kún theebin,* BURM.

The most delicate and graceful of Indian palms. The natives chew the nut in a preparation called *pán,* containing, in addition, lime, spices, and the betel-pepper leaf. This, acting chemically upon the saliva, colours it red. A decoction of the *nut* is used in dyeing, and a kind of inferior Catechu is prepared from it. With *Tún* (**Cedrela Toona**) it is said to give a red dye. *Pán* is also used in Dinajpur as a subsidiary in dyeing red with **Morinda tinctoria.** (*Dr. M'Cann's Report.*)

Arnabia sp., BORAGINEÆ. 34

Dr. **Dymock** informs me this root is imported into Bombay from Afghanistan and used as a substitute for **Alkanet,** which see.

ARNOTTO.

Arnotto, the seeds of **Bixa Orellana,** *Linn.,* which see.

Arsenic. 35

Arseniate of Potash is used for preserving hides. Crude white arsenic is used as veterinary medicine in Burma. (*Prof. Romanis.*)

Information of the uses and trade in this substance would be most acceptable.

AUXILIARIES.

ARTOCARPUS.

36 **Artocarpus integrifolia,** *Linn.*, URTICACEÆ.

THE INDIAN JACK TREE.

Vern.—*Panas, phanasa,* HIND.; *Kánthál,* BENG.; *Panasa,* SANS.; *Pillah,* TAM.; *Palah-maram,* TEL.; *Pienné,* BURM.

A low but densely-branched tree, met with all over India and Burma, its trunk burdened with a monster fruit often 1 to 2½ feet in length.

The wood, or its saw-dust, yields on decoction a yellow dye, used to colour the Burmese priest's cloth, and to some extent it is used also in Madras and other parts of India and in Java. It is fixed with alum, and often intensified by a little *turmeric.*

37 **A. Lakoocha,** *Roxb.*

Vern.—*Barhal, dahu, lakúch,* HIND.; *Dephúl,* BENG.; *Lakucha,* SANS.; *Tuin,* PB.; *Lovi,* DEC.; *Kammaregu,* TEL.; *Myauklót* or *Mi-auk-tok,* BURM.

A common tree in Bengal, South India, and Burma.

The root yields a yellow dye.

ASTRAGALUS.

38 **Astragalus hamosus,** *Linn.*, LEGUMINOSÆ.

Vern.—*Táj-bádsháhi, katilá,* HIND.

An annual, found in Biluchistan, Sind and the Punjab.

The *Amsterdam Descriptive Catalogue* by **T. N. Mukherji** says: "By dyers and calico-printers it is employed as an adjunct to dyeing substances, for producing a glaze on the coloured stuffs." This might be said of any member of the genus which yields Gum Tragacanth, but it would be interesting to have this record of actual use confirmed by specimens of the gum, and of the plant from which it was obtained. Gum Tragacanth is imported into India.

39 **Auxiliaries** used in dyeing, some of which cannot be viewed as Mordants.

Mineral substances:

1. **Lime.**—This is used in calico-printing with gums as a "resist paste." It is also used with sugar to promote the fermentation of indigo.

It is prepared from the following:—

(*a*) Limestone Rock, such as that obtained from the Khásia Hills.

(*b*) From *Kankar,* the calcareous tuberculated masses found in beds on the surface, or a little below the surface, of the soil from Behar northward to the Punjab. In the North-West Provinces this is used for metalling the roads.

(*c*) By burning Land Shells collected in Bengal just after the rains.

2. **Potash.**—This is chiefly obtained from the ashes of certain plants. The Common Millet is largely used for this purpose in the North-West Provinces. **Symplocos** and other bushy plants in the hills of Bengal; but in the plains of Bengal the ash of *Apáng* (**Achyranthes aspera,** *L.*) is largely used for this purpose.

3. **Reh,** an impure carbonate and sulphate of soda, found as a natural efflorescence on the soil, often rendering it uncultivable and burning up the vegetation. This is used, chiefly, like soap, to wash fabrics, before dyeing them.

4. **Rassi.**—Carbonate of soda prepared from the preceding by precipitation of impurities.

5. **Sáji,** a mixture of carbonate of soda and potash or wood-ash. This is used chiefly in extracting the deeper red colours from safflower.

6. **Saltpetre** is obtained like *Reh* as an efflorescence on the surface of the soil; it is chiefly used in wool-dyeing.

See also **Iron Sulphate, Ochre** and **Proto-sulphate of Iron.**

AVERRHOA.

Averrhoa Carambola, *Linn.*, GERANIACEÆ. 40

Vern.—*Karmal,* HIND.; *Kámrángá,* BENG.; *Khamaraka, karamara,* BOM.; *Khamrak,* DEC.; *Tamarta,* TAM.; *Karomonga,* TEL.

A small tree with sensitive leaflets, 15 to 20 feet in height; a native of Ceylon and the Moluccas, but now extensively cultivated in India for its apples, which when stewed are very pleasant.

The unripe apples are astringent and are used as an acid in dyeing. The acid probably acts as a mordant. (*Dr. Bidie.*)

AVICENNIA.

Avicennia officinalis, *Linn.*, VERBENACEÆ. 41

THE WHITE MANGROVE.

Vern.—*Bina* (*Bani, in Gamble*), BENG.; *Mada, nalla-mada,* TEL.; *Tivara,* SIND; *Oepata,* MAL.; *Lameb,* BURM.

A small tree or shrub of the salt marshes and the tidal forests of India and Burma, found also in Andaman Islands. **Roxburgh** says it is common near the mouths of rivers, where the spring tides rise; also is found everywhere in the Sunderbans, often becoming a tree of considerable size; but on the Coromandel Coast it is only bush.

The bark is used as a tanning agent (*Birdwood, Bombay Prod.*). The ashes of the wood are used to wash cloth (*Drury*). In Rio Janeiro the barks of various species of **Avicennia** are used in tanning leather.

BACCAUREA.

Baccaurea sapida, *Müll. Arg.*, EUPHORBIACEÆ. 42

Vern.—*Lutco,* HIND.; *Kala bogoti,* NEPAL; *Latecku,* ASS.; *Koli, kuki,* KAN.; *Kanaso,* BURM.

A small tree, met with in Bengal, Burma and the Andaman Islands.

The leaves are used in Northern Bengal and Assam for dyeing. (*Gamble.*) The bark is used chiefly as a mordant in dyeing with madder and lac. "The Lepchas extract a *green* dye from the *leaves.*" (*Dr. Schlich.*) It is extremely doubtful whether any plant alone yields a green dye; careful inquiry should be made to ascertain whether the leaves of this plant are macerated along with the Lepcha indigo plant (**Marsdenia tinctoria**) to produce the green colour alluded to by Dr. Schlich.

Additional information and specimens required. 43

Bambu ash.

BARRINGTONIA.

44 **Barringtonia acutangula,** *Gaertn.*, MYRTACEÆ.

Vern.—*Ijál, samundar phúl, panniári,* HIND.; *Hijál, samundar,* BENG.; *Hendl,* ASS.; *Kanapa, batta, kurpá,* TEL.; *Kyéni,* BURM.

An evergreen tree, met with in the Sub-Himálayan tract, from the Jumna eastward to Oudh, Bengal, Central and South India, and Burma.

The bark is used as a fish intoxicant, and also for tanning. (*Gamble.*)

BASELLA.

45 **Basella cordifolia,** *Lam.*, CHENOPODIACEÆ.

Vern.—*Pol,* HIND.; *Kukto-pooi,* BENG.; *Alla-batsalta,* TEL.

Met with in Bengal and the Peninsula, cultivated in almost every part of India.

It yields a very rich purple dye, but is difficult to fix. (*Drury.*)

BASSIA.

46 **Bassia latifolia,** *Roxb.*, SAPOTACEÆ.

Vern.—*Mahua, mahula, maut, mahwa, mowa,* HIND., BENG.; *Irúp, irrip,* GOND; *Mová, mahuá,* BOM.; *Moho,* MAR.; *Illupi, elupa, kat illipi,* TAM.; *Ippi, yeppa,* TEL.; *Honge,* KAN.

A gregarious tree, often associated with the *Sál*; a native of the forests of Central India; widely cultivated throughout India for its fruits, oil, &c.

The bark is often used as an adjunct in dyeing where dark colours or black are desired. The bark and the leaves are sometimes also used as a tan.

BAUHINIA.

47 **Bauhinia purpurea,** *Linn.*, LEGUMINOSÆ.

Vern.—*Koliár, kaniar, kandan,* HIND.; *Koirál, rakta-kánchan,* BENG.; *Koiral, karár,* PB.; *Devakanchana,* BOM.; *Pedda-are,* TAM.; *Kánchan,* TEL.; *Surul,* KAN.; *Mahahlegani,* BURM.

A small, elegant tree, 20 to 30 feet high, found in Bengal, Burma, the North-West Provinces and South India.

The bark is used for dyeing and tanning.

48 **B. variegata,** *Linn.*

Vern.—*Káchnar, koliár kurál, padrián,* HIND.; *Rakta kánchan,* BENG.; *Taki,* NEPAL; *Raha,* LEPCHA; *Segapu-munthari,* TAM.; *Bwechin,* BURM.

A small, deciduous tree, completely covered with large, purple and white flowers in the beginning of the hot season. Common everywhere from the Indus eastward and through the forests of India and Burma; ascending to 4,000 feet in altitude, preferring the low hills of India to the plains, but largely cultivated as an ornamental tree throughout the plains.

The bark is used in dyeing and tanning.

BERBERIS.

Berberis aristata, *DC.*, and **B. Lycium,** *Royle*, BERBERIDEÆ. 49

THE BARBERRY.

Vern.—*Chitra, dar-haldi, rasaut, kashmal,* HIND.; *Súmlú, simlú, kasmal,* PB.; *Chitra, sirishk,* PERS.

Thorny shrubs, with small simple, spiny leaves, met with throughout the Himálaya. The former is found from the Sutlej to Bhutan, altitude 6,000 to 10,000 feet to the western ghâts; the latter seems to be confined to the North-Western Himálaya.

A yellow dye, obtained from the root, is used in tanning and colouring leather. The wood is generally known as *dárahalada*; the extract as *rasota, rusot, rasavanti,* or *ruswul;* the fruit as *ambarabárisa* (*see Dymock's Mat. Med., Western India*).

Professor Solly, in *Agri-Horticultural Society, Calcutta, IV, pages 272-279,* writes that the colour exists chiefly in the bark and in the young wood immediately below the bark, and that in old wood the proportion is small but much superior in quality. In India it appears the root only is used; it also contains colouring matter, but, according to the Professor, not of so good a quality. This is perhaps one of the best tanning dyes in India. The supply is quite inexhaustible, some five or six species occurring everywhere in great abundance along the entire Himálaya, between 6,000 and 10,000 feet, and often constituting thickets of many miles in length. They are equally plentiful on the Nilgiris and in Ceylon.

From the wood is obtained a decoction, which is boiled down to form the resin *rusot.*

B. nepalensis, *Spreng.* 50

Vern.—*Amúdanda, chiror,* PB.; *Chatri, milkisse, jamne-munda,* NEPAL.

A shrub or small tree with large pinnate leaves, common on the outer Himálaya, from the Ravi eastward to the Khásia and Naga Hills, in Tenasserim and on the Nilgiris, at altitudes above 5,000 feet.

Used to a small extent as a yellow dye by the Bhutias and Nagas.

BIXA.

Bixa Orellana, *Linn.*, BIXINEÆ. 51

THE ARNOTTO DYE.

Vern.—*Latkan,* HIND., BENG.; *Shendri,* MAHR.; *Jarat,* ASS.; *Rei Rom,* MANIPUR; *Kuragú-mangjal,* TAM.; *Jafra,* TEL.; *Thidin,* BURM.

A graceful shrub, with handsome white or pinkish flowers and echinate red capsules; originally a native of America, now largely cultivated in India for the red or orange dye obtained from the pulp which surrounds the seed.

This pulp gives a beautiful flesh colour, largely used in dyeing silks. It is altered by certain combinations into orange, deep orange or red, the brighter orange and red colours being obtained in combination with the red powder of **Mallotus philippinensis.** The dye is exported to Europe chiefly from the West Indies, and is used chiefly to colour cheese and other edible articles, such as chocolate, &c. It may be extracted from the seeds direct, or the pulpy matter may by boiling be separated from the seeds and made into cakes like those of lac or indigo. In this form it is generally sold in Europe. Specimens of Arnotto Cake much required; there is none in our collection.

BOMBAX.

52 **Bombax malabaricum,** *DC.*, Malvaceæ.

Vern.—*Semul, shembal, semur,* Hind., Beng.; *Sávara,* Mahr.; *Simbal, shirlan,* Himalayan names; *Bonro,* Uriya; *Illavam, pulá,* Tam.; *Mocha,* Sans.; *Katm-imbúl,* Cingh.; *Letpan,* Burm.

A very large, deciduous tree, found throughout India and Burma.

Christy includes this amongst his list of Indian tans under the name of *mucherus*; most probably this should be *Mocha-ras* (the juice of *Mocha*), the name given in India to the gum obtained from this tree, which is sometimes used in calico-printing. There seems to be no mention of the bark of this tree being used in India as a tan.

53 **Borax,** a natural mineral, or Berase of Soda.

Vern.—*Sohaga.*

It is chiefly found associated with common salt in the margins of lakes in Tibet and Nepal. It is imported into India, and to a certain extent is used in calico-printing, especially along with turmeric.

BRIEDELIA.

54 **Briedelia montana,** *Willd.*

Vern.—*Kargnalia, khaja, geia, kusi,* Hind.; *Asáná,* Mahr.; *Geio,* Nepal; *Kaisho,* Ass.; *Patenga,* Tel.

A moderate sized tree of the Sub-Himalayan from Jhelum eastward ascending to 4,000 feet, Oudh and Bengal.

Dr. Dymock thinks that the leaves might be used in tanning.

55 **B. retusa,** *Spreng.*, Euphorbiaceæ.

Vern.—*Khaja, kassi, gauli,* Hind.; *Pathor, mark,* Pb.; *Geio,* Nepal; *Pengji,* Lepcha; *Kashi,* Gáro; *Mulu-vengay, kamanji,* Tam.; *Kora-mau, duddi máddi,* Tel.; *Seikgyi* or *Tseikchyee,* Burm.

A large, thorny tree, met with on the Himálaya from the Chenab eastward to Bengal, Central and South India, and Burma.

The bark is used in tanning.

BRUGUIERA.

56 **Bruguiera gymnorhiza,** *Lam.*, Rhizophoreæ.

Vern.—*Kakra, kankra,* Beng.; *Byu-bo,* Burm.

A small, evergreen tree of the shores and tidal creeks of India, Burma, and the Andaman Islands.

The bark is valuable, and with **Rhizophora mucroneta,** *Lam.*, constitutes the tan known commercially as Mangrove Bark (which see).

BUCHANANIA.

57 **Buchanania latifolia,** *Roxb.*, Anacardiaceæ.

Vern.—*Chirauli,* Pb.; *Piál, payála* Garhwal; *Piár,* Oudh; *Kat maá, aima,* Tam.; *Chara,* Tel.; *Pyal, chároli,* Bom.; *Lunbo, lonepho,* Burm.

A small tree of the lower mountains of India and the outer Himálaya, ascending to an altitude of 3,000 feet.

The bark is used in tanning.

BUTEA.

Butea frondosa, *Roxb.*, LEGUMINOSÆ. 58

BENGAL KINO ; sometimes called the BASTARD TEAK.

Vern.—*Dhák*, HIND. ; *Palás, palash*, BENG. ; *Kinsuka*, SANS.; *Pallás*, DEC. ; *Palasa, khákará*, BOM. ; *Porasan, parasa*, TAM. ; *Tella moduga*, TEL. ; *Pauk, pin*, BURM.

A small, distorted tree with bright, orange flowers, found all over India. The dried flowers, called *tesu*, are used as a yellow dye, the dye being extracted by simply steeping or boiling in water. The colour is, however, fleeting (*see* **Roxburgh's** remark in his *Flora Indica*) ; but it may be made less so by using alum or lime as a mordant, which also deepens the colour. Sometimes myrabolans are used for this purpose, or the dye is combined with arnotto (**Bixa Orellana**).

Gamble says the yellow dye obtained from the *tesu* flowers treated with alum is used at the *Holi* festival.

B. superba, *Roxb.* 59

Vern.—*Palásí, palasavela*, BOM. ; *Yél parás*, MAR. ; *Tige motku*, TEL. ; *Samur*, GOND ; *Pauknwé*, or *paukgnwé, ne-ba-sai*, BURM.

A large climber, met with in many parts of India, the flowers of which are used like the preceding.

The root is said to yield a red dye in Burma.

CÆSALPINIA.

Cæsalpinia coriaria, *Willd.*, LEGUMINOSÆ. 60

Vern.—*Libidibi*, BOM. ; *Shumak*, TAM. ; *Sumaqe-amriqah*, PERS., ARAB.

This is the American Divi-divi or American Sumach. *See* **Divi-divi** or **Libi-dibi.**

The sinuous pods of this plant are used for tanning leather.

C. Sappan, *Linn.* 61

THE SAPPAN WOOD.

Vern.—*Bakam, Tairi*, HIND., GUZ., BENG. ; *Bokmo*, URIYA ; *Pat-anga*, TAM., BOM. ; *Bakamu, bakapu*, TEL. ; *Teinnyet*, BURM.

A small, thorny tree of the Eastern and Western Peninsula and Pegu. Cultivated in Central India in plantations.

The wood yields a valuable dye, which is largly exported. The dye is also said to be prepared from the pods (*tairi*), from the pith, from the bark, or from all together.

The pods are used in Monghyr along with proto-sulphate of iron to give a black colour. Sappan wood is largely used in calico-printing, its price being about R 12 a cwt. Chips of the wood steeped in water yield the red colour. This is intensified by alkalis. Combined with turmeric and sulphate of iron, it gives the colour known as *Kalejai.* With indigo it gives (*sausni*) purple. Sappan colour, however, is not permanent, being formed through the presence of the soluble substance Brazilin. (*Mr. Buck, Dyes and Tans of the North-Western Provinces* and *Dr. McCann's Report on the Dyes and Tans of Bengal.*)

Sappan wood is used with alum to communicate to starch the red colour which converts it into *Gulál*, the red powder used in the *Holi* festival. (*Dr. Dymock.*)

CALOTROPIS.

62 **Calotropis gigantea,** *R. Br.*, ASCLEPIADEÆ.

Vern.—*Madár, ark, ak,* HIND.; *Akandá,* BENG.; *Auk,* NEPAL; *Arka, pratápasa,* SANS.; *Ushar,* ARAB.; *Kharak,* PERS.; *Akra, rui,* BOM.; *Yercum,* TAM.; *Yerica,* MAL.; *Nella-jilledu, yekka, jilledu chettu,* TEL.; *Yekka,* KAN.; *Mayo-ma-yo-pin, mohu-pin,* BURM.

A large shrub, found all over India in waste places and along the road-sides. The fibre is exceedingly strong and good; the hairs from the seeds are largely used for stuffing pillows; the wood is used for making charcoal; and the root and the milky sap are regarded as valuable medicines.

The bark of the root alone was in olden times called *madar* (see **Ainslie**), and it seems a pity that this restricted use of the word has been lost sight of.

The milky sap is well known in tanning. It is made into a paste with the flour of the small millet (**Penicillaria spicata**), and is used previously to colouring the skin with lac dye. Alone it imparts a yellow colour to the skin.

63 **C. procera,** *R. Br.*

Vern.—*Safed-ark, ak,* HIND.; *Mándára, akadu, rui,* BOM. and SIND; *Alarka,* SANS.; *Vellerkú,* TAM.; *Tella, jelladú,* TEL.; *Shalwakka,* AFG.

This is a smaller plant, with white, or almost white, flowers, occurring more abundantly than the preceding in the North-West Provinces, Punjab, and South India; popularly they are not distinguished, and may be used for the same purposes.

The sap of this plant has, on several occasions, been recommended as a substitute for gutta-percha.

CAREYA.

64 **Careya arborea,** *Roxb.*, MYRTACEÆ.

Vern.—*Kumbi, khumbi,* HIND.; *Gummar,* GOND.; *Boktok,* LEPCHA; *Dambel,* GARO; *Ayma, pailæpoota-tammi,* TAM.; *Budá-durmi, dudippi,* TEL.; *Gavuldu,* MYSORE; *Bambway,* BURM.

Found in the Sub-Himalayan tract, from the Jumna eastward to Bengal, and Burma, and in Central and South India.

Bark used for tannin. (*Kurz.*)

CARISSA.

65 **Carissa Carandas,** *Linn.*, APOCYNACEÆ.

Vern.—*Karaunda, karúnda, garinga, karroná,* HIND.; *Kurumia, karamcha, bainchi,* BENG.; *Karavanda,* MAHR.; *Karmurda,* SANS.; *Kalaka,* TAM.; *Kalivi kaya,* TEL.

A bush, cultivated for its fruit in most parts of India; said to be wild in Oudh, Bengal, and South India.

Dr. McCann states that in Bhagalpur the fruit is used as an auxiliary in dyeing and tanning.

CARPESIUM.

66 **Carpesium abrotanoides,** *Linn.*, COMPOSITÆ.

Vern.—*Wotiángil,* KASHMIR.

A stout herb, met with abundantly in and near Kashmir.

Largely used in Kashmir to dye silk yellow.

Specimens of the plant and dye should be supplied, as this dye-stuff is quite unknown outside Kashmir. It is described by **Vigne** and by **Stewart**, and the *Flora of British India, iii, 301.*

CARTHAMUS.

Carthamus tinctorius, *Linn.*, COMPOSITÆ. 67

THE SAFFLOWER, *Eng.*; CARTHAME, *Fr.*; DER SAFLOR, *Ger.*

Vern.—*Kusum,* HIND., DEC., and BENG.; *Galáp machú,* MANIPUR; *Qurtum,* ARAB.; *Kashirah,* PERS.; *Kamalottara,* SANS.; *Kusumba,* BOM.; *Sendurgam, kushumbá,* TAM.; *Agnisikha,* TEL.; *Heboo,* BURM.
In Sind the seeds are called *Kardai* (*Kurtum*).

An annual, herbaceous plant, with large yellow flower-heads, cultivated as a dye-crop all over India.

The flowers yield both a red and a yellow dye; and the seeds give a useful oil. To prepare the red dye, the yellow is first carefully removed. This is done by reducing the flowers to a powder and sprinkling over it a little water or oil. After a time, the yellow dye is removed by simple straining. This is either rejected as useless, or used as a base colour before red. After the removal of the yellow dye, an alkali is mixed with the powdered flowers and rubbed in with the hand. On placing this mixture on a strainer, the bright red dye solution is obtained by the application of a little water.

CASSIA.

Cassia auriculata, *Linn.*, LEGUMINOSÆ. 68

Vern.—*Tarwar,* HIND.; *Taravada,* BOM.; *Avarai,* TAM.; *Tangedu, tanger,* TEL.; *Avareke,* KAN.

A common shrub in South and Central India.

The bark is one of the most valuable Indian tans, and is also, like myrabolans, used to modify dyes. It is said to give a buff colour to leather. The flowers yield a yellow colouring matter, apparently not used economically.

C. Fistula, *Linn.* 69

THE INDIAN LABURNUM.

Vern.—*Amaltás,* HIND.; *Sundáli, sunari, bandarlati,* BENG.; *Kitwáli, kitoli, sim,* N. W. P.; *Suvarnak,* SANS.; *Bhawa,* DEC.; *Jaggarwah, raila, hirojah,* C. P.; *Báhavá, giramálá,* BOM. and SIND.; *Konrikte,* TAM.; *Rela-kayalu,* TEL.; *Ngushwe, emoo-kyee, gnu-gyi,* BURM.

A middle-sized tree, 20 to 40 feet in height, found wild or in cultivation all over India, coming into flower at the beginning of the hot season.

The bark is used in tanning, chiefly along with Terminalia. **McCann** reports that in the district of Lohardagga, in Bengal, a light red dye is obtained from the bark, with alum as a mordant; and that in Dacca and Cuttack, the bark of this tree is used as a tan. **Mr. Buck** says it is used to a small extent in Cawnpore. **Mr. Gamble** says "the bark is used in dyeing and tanning."

C. Tora, *Linn.* 70

THE FŒTID CASSIA.

Vern.—*Chakunda, panevár,* HIND. and BENG.; *Tánkalá, kovariya,* BOM.; *Tarota,* DEC.; *Ushit-tagari,* TAM.; *Tagarisha-chettu,* TEL.; *Dan-gywé,* BURM.; *Prabanatha,* SANS.

A gregarious under-shrub, from 1 to 2 feet in height, found everywhere in Bengal, widely spread and abundant throughout India.

Mr. Baden-Powell says that the seeds of this shrub are used as "a blue dye." This is apparently taken from **Ainslie**, who says that, "in Coimbatore the seeds are had recourse to in combination with the *pala* (**Wrightia tinctoria**, *Br.*) in preparing a blue dye." **Mr. Hutchins**, Assistant Conservator of Forests, Mysore, reports that the average collection of the seeds of this plant is about 12 tons in Nundidroog, and imagines that they act the part of starch in the indigo solution. It is a little difficult to understand what **Mr. Hutchins** means by indigo. **Wrightia tinctoria** yields of course the chemical substance indigo, but from the use of the popular word indigo one would infer that either the blue dye was extracted from the **Wrightia** in such quantities in Mysore as to justify the word indigo, or then that **Mr. Hutchins** was alluding to the use of **Cassia Tora** seeds along with the true commercial indigo. The latter conclusion if correct is exceedingly curious and quite unknown to the indigo dyers of Bengal. What peculiar action starch could have upon the dye, it is difficult to understand. The natives of Assam and Manipur use lime along with their indigo (the produce of **Strobilanthes flaccidifolius**), and it seems likely that the reactions with the indigos of different plants may be peculiar and specific. This subject seems worthy of careful chemical examination.

CASTANOPSIS.

71 **Castanopsis** or **Indian chestnuts.**

Several species of this genus are met with on the mountains of Eastern India, but none are reported to be used for tanning. This is probably an oversight, since the European members possess this property to a considerable extent, **Castanea vesca** containing 14 to 20 per cent. of tannic acid.

CASUARINA.

72 **Casuarina equisetifolia,** *Forst.*, CASUARINEÆ.

THE BEEFWOOD OF AUSTRALIA.

Vern.—Commonly called the *Jau* tree in BENG.; *Júrijur, mujjum*, SIND; *Chouk*, TAM.; *Kasrike*, MYSORE; *Aru*, MAL.; *Serva*, TEL.; *Tinyu*, BURM.

Cultivated all over India, apparently wild on the Mergui Coast and in Australia.

The bark is used in tanning. (*Birdwood, Bombay Prod., and Bidie's Madras Exhibition List for 1855.*) A brown dye is extracted from it according to **Balfour.**

CEDRELA.

73 **Cedrela Toona,** *Roxb*, MELIACEÆ.

THE TOON OR INDIAN MAHOGANY TREE.

Vern.—*Tún, mahánim*, HIND.; *Tuni, tun*, BENG.; *Drawi*, PB.; *Túpa, kudaka*, BOM.; *Poma*, ASS.; *Simal*, LEPCHA; *Maha limbu*, URIYA; *Kal kilingi*, NILGIRIS; *Tunamarum*, TAM.; *Nandi*, TEL.; *Tundú*, KAN.; *Thitkado*, BURM.

A tree about 50 to 60 feet in height, growing in the plains of India and lower mountains.

The flowers yield a red and a yellow dye (in Bengal generally known as *Gulnari*) said to be used in Mysore for dyeing cotton. This must be to a small extent only, since **Dr. Bidie** omits it from his list of Madras dyes sent to Paris. The flowers are boiled to extract the colour, which is known as *basanti* in the North-West Provinces. It is fleeting, and apparently only used by the poorer classes. In Burma it is used in conjunction with safflower.

Mr. Buck, in his *Report on the Dye-stuffs of the North-Western Provinces,* says that a red dye is obtained from the seeds, and Dr. McCann, in his *Report on the Dyes of Bengal,* says the seeds are used as a dye-stuff at Pálamau.

Apparently *Tún* is not used with mordants, and is rarely combined with other dyes. The sulphur yellow (*basanti*) of Cawnpore is produced from tún, turmeric, lime and acidulated water. Safflower and tún are combined in Tirwa. Dr. McCaun says the cloth previously dyed yellow is changed into red by the *pan* eaten by Hindús.

CERIOPS.

Ceriops Candolleana, *Arnott.*, RHIZOPHOREÆ. 74

Vern.—*Goran,* BENG.; *Kirrari, kiri, chauri,* SIND.; *Madá,* AND.

A small, evergreen tree, met with on the muddy shores and tidal creeks of India and the Andaman Islands.

The bark is used for tanning. This and the next species are economically not distinguished, both being used under the name of *gáran* or *goran.* They are exceedingly valuable tans and deserve to be brought pointedly to the notice of European tanners. They, no doubt, to a small extent reach England under the name of Mangrove Bark. They impart a good red colour to leather.

C. Roxburghiana, *Arnott.* 75

Vern.—*Garán or Ghorán,* BENG.; *Kabaing, kyabaing,* BURM.

A large shrub of the coasts of Chittagong, down to Tenasserim. (*Kurz.*)

The bark is used in tanning leather. This and the preceding species might be supplied to any extent very cheaply, and there seems a good future for *Garan* barks in tanning. They also yield a good colouring matter. In Balasore the *Garan* grows abundantly on the sea-shore; a good dye is prepared from the bark in that district, and is used to give a brown colour. It is supposed to strengthen ropes and boatmen's cloths. (*McCann.*)

Chay root. *See* **Oldenlandia umbellata,** *Linn.*, RUBIACEÆ. [189]

CHICKRASSIA.

Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ. 76

Syn.—SWIETENIA CHICKRASSA, *Roxb.*

Vern.—*Chickrassi,* BENG.; *Pabha, chikrása,* BOM.; *Aglay-agal,* TAM.; *Madagari,* TEL.; *Dalmara,* KAN.; *Arrodah,* AND.; *Yinma,* BURM.

A large tree, native of Eastern Bengal, South India and Burma.

The bark is a powerful astringent; the flowers yield a red and a yellow dye.

CICER.

77 **Cicer arietinum,** *Linn.*, LEGUMINOSÆ.

THE COMMON GRAM OR CHICKEN PEA

Vern.—*Chaná, chenna,* HIND.; *Cholá, bút,* BENG.; *Harabará* MAHR.; *Kadalay,* TAM.; *Sane, gatu,* TEL.; *Kudoly,* KAN.; *Hims,* ARAB.; *Nakhud,* PERS.

Cultivated throughout India and Upper Burma for its seed.

The leaves are said to give indigo.

78 **Cinnabar.**

SULPHIDE OF MERCURY.

Vern.—*Shingarf,* HIND.; *Sindur,* BENG.

A beautiful pink, sometimes used as a dye, but more frequently as a pigment vermilion, which may be prepared by reducing the ore to a powder, or by chemical action.

CINNAMOMUM.

79 **Cinnamomum Tamala,** *Nees,* LAURINEÆ.

CASSIA LIGNEA OR CASSIA CINNAMON.

Syn.—LAURUS CASSIA, *Roxb.*; CINNAMOMUM CASSIA, *Blume.*

Vern.—*Dalchini, kirkiria, kikra, silkanti, sinkami,* HIND.; *Darchini,* BOM.; *Chota sinkole,* NEPAL; *Dopatti,* ASS.

The leaves are known as *Tejpat,* and the bark as *Taj.*

A moderate sized, evergreen tree, occasionally met with on the Himálaya, from the Indus to the Sutlej, altitude 3,000 to 7,000 feet, becoming common eastward to Bengal, Khásia Hills and Burma. (*Gamble.*)

The leaves are commonly used as a condiment, but they are also of use in calico-printing in combination with Myrabolans. **Dr. McCann** says that in Lohardaga, Chutia Nagpur, the bark (*taj*), is used as an auxiliary with **Mallotus philippensis.** About 33 tons of the leaves and 24 tons of the bark are annually exported from the tract between the Ramganga and the Sarda. **C. Tamala** is most likely to yield the *Taj* (*Atkinson*) and *Tejpát* of the North-West Provinces and Punjab, but in Bengal the leaves and bark of **C. obtusifolium,** *Nees,* more commonly bear these names. In fact the leaves of any species of the genus would be at once called *Tejpat* by a native, but for economic purposes **C. Tamala** is superior to any of the other Indian species. The bark of this plant is the **Cassia Lignea** of Indian Commerce. The Cassia Cinnamon of Europe is obtained from China, the source of which is still obscure. It is chiefly however attributed to **C. Cissia,** *Bl.*, which it seems may be proved to be but a form of **C. Tamala,** *Nees* (Gamble reduces it to be a synonym.) The true Cinnamon is, however, **C. zeylanicum,** *Breyn.* The roots of **C. zeylanicum** as also, sparingly, of **C. Tamala** and **C. obtusifolium,** yield Camphor, but the true Camphor plant of commerce is **C. Camphora,** *Nees,* a native of Japan.

CITRUS.

80 **Citrus medica,** *Linn.*, RUTACEÆ.

THE CITRON, LEMON, LIME.

Vern.—*.eg-pura, korna-nebu, lebu, nebu, bijawra, bara nimbu,* BENG; *Jambíra,* SANS.; *Limbu, kutla nimbu, limu,* HIND.; *Bijapúra, mahálunga, bijorí,* BOM.; *Elumich-cham-pazham,* TAM.; *Nimma-pandu,* TEL.; *Nimbe hanu,* KAN.; *Limu,* ARAB. and PERS.; *Shouk-ta-kwoh, thanba-ya,* BURM.

The leaves of this plant are stated by **Dr. McCann** to be used in tanning in Mánbhúm. This seems to be doubtful; at most the leaves can be used only as an adjunct to the tans, imparting an odour to the leather.

COCCUS.

Coccus Cacti, *Linn.*, HEMIPTERA. 81

COCHINEAL DYE.

The dried bodies of the female insects; obtained commercially from America and Central Asia, but recently obtained in small quantities from Rajputana and South India.

The dye is held in high esteem.

C. Lacca. 82

LAC DYE.

The dye obtained by evaporation from the liquid in which stick-lac has been washed. As a European article of trade, lac-dye seems to be losing any position it ever had, aniline and cochineal taking its place. It is used by the natives to a considerable extent, and chiefly in colouring leather.

Copper sulphate, used as a mordant and dye auxiliary.

Information of existence in India and trade in this salt would be most acceptable. 83

CORDIA.

Cordia Myxa, *Linn.*, BORAGINEÆ. 84

Vern.—*Lasora, chokar, gondi,* HIND.; *Bohari, buhul,* or *boho-dari,* BENG.; *Bhokara,* MAHR.; *Nimat,* LEPCHA; *Laswara,* PB.; *Lesuri, giduri,* SIND.; *Borla,* KUMAUN; *Vidi, verasu,* TAM.; *Tha nap,* BURM.

Dr. **McCann** states, in his *Report on the Dyes of Bengal,* that the green leaves of this tree are used in dyeing, along with **Morinda tinctoria,** in Darjiling.

COSCINIUM.

Coscinium fenestratum, *Colebrooke,* MENISPERMACEÆ. 85

Vern.—*Jar-ki-huldi* or *jhádihaladi,* DEC.; *Haldi-gach,* BENG.; *Mara-munjil,* TAM.; *Manipussupu,* TEL.; *Darvi,* SANS. (*Ainslie.*)

An extensive climber of the forests of the Western Peninsula, extending to Ceylon and the Straits.

In Dr. **U. C. Dutt's** *Materia Medica* of the Hindus, *Darvi* is given as the Sanskrit for **Berberis sp.** Neither **Brandis** nor **Gamble** give that name, or any apparent derivatives from it for the species of **Berberis,** nor is it given by any other author. **Ainslie** on the other hand gives *Darvi* as the Sanskrit for **Coscinium fenestratum.** Both **Coscinium** and **Berberis** yield a yellow dye; both are valuable as medicines; and the chips of the wood, but for structural peculiarities, could not be distinguished. **Ainslie** apparently was labouring under one mistake; he took the *Mara-munjil,* Tamil, as different from the *Vinivel-getta,* Ceylon specimens of which were sent to **Roxburgh** for identification. **General Macdowall** took the Ceylon specimens of this species for **Colomba** root, but **Roxburgh** corrected him. Speaking of *Mara-munjil* **Ainslie** says, "it is sometimes used as a yellow dye," but this was apparently unknown to **Roxburgh.**

Dr. **Bidie** remarks: "This wood contains much colouring matter, akin in properties to that of turmeric," hence the name *jar-ki-huldi* or *ghach-huldi.*

CRATÆVA.

86 **Cratæva religiosa,** *Forst.*, CAPPARIDEÆ.

Syn.—CAPPARIS TRIFOLIATA, *Roxb.*
C. ROXBURGHII, *Ham.*
C. NURVALA, *Ham.*

Vern. – *Brarna, bilási, bila,* HIND.; *Barún, tikto-shak,* BENG.; *Váyavarna, bhátavarná, hádavarná,* BOM., *Maralingam,* TAM.; *Uskia, usiki ulimidi,* TEL.; *Kadet, kadat,* BURM.

A moderate sized, distorted tree, met with from the Ravi eastward to Bengal, Assam, Central and South India and Burma.

"Aitchison states that at Jhelum the fruit is mixed with mortar to form a strong cement, and the rind as a mordant in dyeing." (*Stewart.*)

CROCUS.

87 **Crocus sativus,** *Linn.*, IRIDEÆ.

THE SAFFRON DYE.

Vern.—*Kesar, késara safran,* HIND.; *Jafran,* BENG.; *Kumkuma,* SANS.; *Kungumapu,* TAM.; *Kumkum-apavu,* TEL.; *Than-wen,* BURM.

The European supply of this plant comes from France, Spain, and Italy. It is extensively cultivated in Kashmir. The Indian supply chiefly comes from France, or from China, a small quantity coming from Persia in the form of cakes known as *Kesar-ki-rote.*

It is chiefly used in Europe as a dye, and to colour cheese, puddings, &c., but very little as a medicine. In India it is too expensive to be used as a dye-stuff. It is, however, held in high esteem as a medicine. The product is obtained from the stigmas of the flowers, 4,000 of which are required to produce an ounce of saffron.

CURCUMA.

88 **Curcuma aromatica,** *Salisb.*, SCITAMINEÆ.

WILD TURMERIC, YELLOW ZEDOARY, COCHIN TURMERIC.

Syn.—C. ZEDOARIA, *Roxb.*

Vern.—*Jangli-haldi, ban-haldi,* HIND., N. W. P.; *Ban-halud,* BENG.; *Banharidrá,* SANS.; *Kasturi-manjal,* TAM; *Kasturi pasupa,* TEL.; *Rán hald, kachorá,* BOM.

The round, short rhizomes of this plant are of a deep yellow colour, and possess an agreeable, fragrant smell and a warm, aromatic taste. It is probable that this, like the Zedoary, was formerly used in the preparation of the *Abír* powder.

89 **C. longa,** *Roxb.*

THE TURMERIC.

Vern.—*Haldi,* HIND.; *Halud,* BENG.; *Halada,* BOM.; *Haridra,* SANS.; *Manjal,* TAM.; *Pasupu,* TEL.

Turmeric is cultivated all over India.

Its rhizomes yield a valuable yellow dye, which, with alkalis, changes into a deep red.

Curcuma Zedoaria, *Roscoe (non-Roxb.)* 90

THE LONG AND ROUND ZEDOARY.

Syn.—C. ZERUMBET, *Roxb.*

Vern.—*Kachora,* HIND., BOM.; *Shati, sati, shori, kachur, kuchúr,* BENG.; *Ránahalada,* BOM.; *Kich chilik-kishaugu,* TAM.; *Kichlie-gaddalu* TEL.; *Thanu-wen,* BURM.

The red powder, *Abír,* used by the Hindus at the Holi festival, is made from the root of this plant ground to a powder and left for some time to saturate in water. The powder being purified and dried is mixed with a decoction of Sappan wood, when the red colour is obtained. The *Abír* is now, however, largely made from aniline dye.

Dr. McCann describes the process adopted in Mymensing district, Bengal, for the preparation of the *Abír* powder; but he appears to have reversed the scientific names of the species of **Curcuma.** The *Shati* has for the past forty years been regarded as **C. Zedoaria,** *Roscoe,* while Dr. **McCann** gives it as **C. Zerumbet,** *Linn,* a name which does not exist in botanical literature. If he means **C. Zerumbet,** *Roxb.,* not *Linn.,* (a synonym for **C. Zedoaria,** *Roscoe*) it is unfortunate he did not publish his economic information under the modern name, since the name **C. Zerumbet,** *Roscoe,* is applied to a perfectly distinct species.

In Bengal the *Gulal* and *Abir* powders seem to be made together and sold mixed. In many parts of the country however this is not the case. The red powder or *Gulal* is prepared from Sappan wood and alum colouring flour. The *Abir* or perfumed powder is not always of the same composition. In Bengal the root-stocks of **C. Zedoaria,** *Roscoe,* are used and apparently as the entire representative of the *Abir* powder of Upper and Western India. The Zedoary is also an ingredient in *Ghisi Abír* along with cloves, cardamoms, Deodar, **Artemisia,** and **Cerasus.** The *Abir* most generally used however contain **Hedychium spicatum,** *Ham.,* instead of Zedoary combined with sandal wood as flour. (*See* **Abir**).

C. Zerumbet, *Roscoe (non-Roxb.)* 91

Vern.—*Bach, mahaburi-bach,* BENG.; *Kachara,* BOM.

The rhizomes are warm, aromatic and used in medicine.

CUSCUTA.

Cuscuta reflexa, *Roxb.,* CONVOLVULACEÆ. 92

THE DODDER.

Vern.—*Akas bel,* HIND., PB.; *Haldi-algusi-luta, algusi,* BENG.; *Ákásavela, amaravela,* BOM.

Mr. Baden-Powell states that at Jhelam this plant is sometimes used as a dye. It would be a great matter if it could be utilised in this manner, many trees being completely covered and often killed by this and another species. The dye is apparently unknown in Bengal. **Mr. Baden-Powell** does not mention the colour; it is probably a yellow.

CYNOMETRA.

Cynometra ramiflora, *Linn.,* LEGUMINOSÆ. 93

Vern.—*Shingr,* BENG. (*as in* **Gamble**); *Irapú,* TAM.; *Myen-ka-pen, myinka,* BURM.

A large, evergreen tree of the Sunderbans, South India and Burma, in tidal forests. Frequent from Chittagong down to Tenasserim and the Andaman Islands. (*Kurz.*)

Chips of the wood give, in water, a purple dye. (*Gamble.*)

CYPERUS.

94 **Cyperus pertenuis,** *Roxb.*, CYPERACEÆ.

Syn.—(? MARISCUS CYPERUS).

Vern.—*Nagur-mutha,* BENG.; *Nágaramothá,* BOM.

A delicate, slender grass, found in damp places in Bengal, Oudh, and the North-West Provinces.

The rhizomes are used in dyeing to give a scent to the fabric, and as a perfume for the hair. Roxburgh describes them as "tuberous with many dark-coloured villous fibres." "Its naked delicate form, small and compound umbel, short slender leaves, and scanty involucre immediately distinguish it" from the other members of the genus.

95 **C. rotundus,** *Linn.*

Syn.—C. HEXASTACHYOS, *Roxb.*

Vern.—*Muthá,* BENG.; *Mustá,* SANS.; *Mustá, kachará,* BOM.; *Kore-kejhár,* DEC.; *Koray,* TAM.; *Shaka tunga,* TEL.

The root of this grass is more frequently used in lower Bengal than the preceding for the purposes described, being more plentiful. Used as a perfume at native marriages. It is the most troublesome weed in Bengal.

DATISCA.

96 **Datisca cannabina,** *Linn.*, DATISCEÆ.

Vern.—*Akalbér,* HIND.; *Bhang-jalá,* PB.; *Bayr-bunja,* SIND.

A tall, erect herb, resembling hemp, hence the specific name, met with in the Punjab Himálaya.

It gives a red and a yellow dye.

DELPHINIUM.

97 **Delphinium saniculæfolium,** *Boiss.*, RANUNCULACEÆ.

Vern.—*Asbarg, ghafis,* PB.; *Zarir,* ARAB.; *Asfrak, asperag, trayaman,* PERS.; *Tráyamána, aspraka, guljalíl,* BOM.

A small, herbaceous plant, met with on the Himálaya on dry hills from Jhelam to the Indus, and distributed to Afghanistan.

The dried flowers are brought from Afghanistan to Multan, where they are used, along with *akalbér* (**Datisca cannabina**) and alum, to dye silk yellow. This gives a beautiful sulphur yellow, known as *gandhaki.* The flowers are very bitter and are used in medicine, under the name of *ghafiz,* as a febrifuge. (*Stewart.*)

DIOSPYROS.

98 **Diospyros Embryopteris,** *Pers.*, EBENACEÆ.

Syn.—D. GLUTINOSA, *Roxb.*

Vern.—*Gáb, makur-kendi,* BENG., HIND.; *Kendu,* ASS.; *Timbwini,* MAHR.; *Tumbika, panichika,* TAM.; *Tumika, tumil,* TEL.; *Timberee,* CINGH.

A small tree or evergreen shrub, forming a dense dome of foliage; met with throughout India and Burma.

The fruit is used for "gabing" boats, to render them waterproof, throughout Bengal; and an infusion is said to preserve fishing nets. The fruit is also largely used as a tan, being a powerful astringent. By simply steeping the half-ripe fruits in water a brownish liquid is obtained, which is sometimes used in dyeing a brown colour. This is made into a good black by being combined with Myrabolans (**Terminalia Chebula**) and Proto-sulphate of iron (*hirakash*).

Diospyros. mollis, *Griff.* 99

Frequent in the drier hill forests of Martaban at 2,000 to 4,000 feet elevation.

The berries produce the so-called black dye of Shans. (*Kurz.*)

D. pyrrhocarpa, *Miq.* 100

Vern.—*Té*, BURM.

Major Ford says the Burmese extract a red dye, and that the Chinese umbrellas are dyed with this plant, which has the property of rendering them waterproof. There are no specimens in our collection as yet.

D. sp. 101

Gamble says that a beautiful black dye is obtained from the bark and fruit of an Andaman species not determined.

Specimens of this plant (sufficiently perfect to admit of identification and of the bark and fruit, might be obtained from the Andaman Islands through **Mr. Mann**, the officer nominated by the Chief Commissioner to answer all communications regarding these islands.

DIVI-DIVI.

Divi-divi or **Libi-Dibi.** 102

The seed pods of **Cæsalpinia coriaria, Leguminosæ**, a tree 20 to 30 feet high, indigenous to the West Indies, Mexico and Brazil, naturalised in Madras and Bombay Presidencies and in the North-West Provinces. The pod may be known by its drying into the shape of the letter S.

It grows freely in Botanic Gardens, Calcutta, where seeds are distributed gratis to all applicants.

The pod contains 30 to 50 per cent. of a peculiar tannin somewhat similar to **Valonia.** "It is cheap, and may be used in admixture with barks, but it is dangerously liable to undergo fermentation, suddenly staining the leather a dark red colour, and is therefore not in extensive use." (*Spons' Ency.*)

"The legumes of this tree, introduced from the Western Hemisphere and now naturalized in some parts of India, contain a large proportion of tannin. According to **Dr. Cornish** from 60 to 65 per cent. of the whole pod, exclusive of the seeds, consists of impure tannin, the remaining portion consisting of woody fibre, starch, and gum." (*Pharm. Ind.*)

"The tree has been introduced into Western and South India and its cultivation deserves to be extended as it is valuable material for tannin." (*Brandis.*)

DREPANOCARPUS.

Drepanocarpus Cumingii, *Kurz*, LEGUMINOSÆ. 103

A tree-like scandent shrub of Tenasserim.

Is a dyewood and furnishes the *Kayu lakka* of commerce. (*Kurz.*)

DROSERA.

Drosera peltata, *Sm.*, DROSERACEÆ. 104

Vern.—*Mukha-jali*, HIND.

Found in Nilgiris and some parts of India.

A dye may be prepared of the plant, as Royle mentions the fact of the paper which contained his dried specimens being saturated with a red tinge. (*Drury.*)

ECLIPTA.

105 **Eclipta alba,** *Hassk.*, COMPOSITÆ.

Vern.—*Kesuti, keysuria, keshwri,* BENG.; *Mákd,* MAHR.

Udoy Chand Dutt in his *Materia Medica, page 181,* says that the Vern. *Kesaraya, bhánrá,* BENG. and HIND., as also *Bhringaraja,* SANS., are indiscriminately applied to this plant and to **Wedelia calendulacea,** *Linn.* This was not the case in Roxburgh's time, nor have I found it so, *Kesuri* being **Eclipta alba,** and *Bángrá* or *Kesaraja* (*Pivalá máká, pivalá bhangra,* MAHR.) **Wedelia calendulacea.**

Speaking of **Eclipta,** Roxburgh says: "In tattooing, the natives, after puncturing the skin, rub the juicy green leaves of this plant over the part, which gives the desired indelible colour, *viz.*, a deep bluish black." Dutt says the leaves of both the plants referred to above are used in various ways for the purpose of dyeing grey hair. It would be interesting to have this confirmed, and to know if both plants, or only **Eclipta,** are actually so used.

ELSHOLTZIA.

106 **Elsholtzia polystachya,** *Benth.*, LABIATEÆ.

Vern.—*Rangchari, mehndi, dúss, pothi,* PB.

A shrub found on the Punjab and North-West extending to the Khásia and Naga Hills Himalaya; altitude 6,000 to 10,000 feet.

To the south of Kashmir it is said to be used as a dye. (*Stewart.*)

ERIOBOTRYA.

107 **Eriobotrya bengalensis,** *Hook. f.*, ROSACEÆ.

Syn.—MESPILUS TINCTORIA, *Don Prod. Nep.*

Vern.—*Berkung,* LEPCHA.

A small tree of the Eastern Himalaya, Sikkim, altitude 4,000 feet; Khásia Hills, Chittagong and Ava.

The bark is said to be used in Nepal for dyeing scarlet.

Information regarding this dye-stuff required.

ERYTHRINA.

108 **Erythrina indica,** *Lam.*, LEGUMINOSÆ.

THE INDIAN CORAL TREE.

Vern.—*Pangra, panjira, farad,* HIND.; *Palita mandar,* BENG; *Pangara,* BOM.; *Pangaru,* MAHR.; *Muruká, kalayána-murukku,* TAM.; *Modugu, badidapu-chettu,* TEL.; *Madar,* CACHAR; *Erabadu-gaha,* CINGH.; *Pinlekathit,* BURM.

A small tree, wild in Oudh, the mountains of Bengal, Assam, Manipur, Burma and South India; largely cultivated in the plains as a hedge plant.

The dried red flowers on being boiled yield a red dye The bark is also said to be used in dyeing and tanning.

EUGENIA.

Eugenia Jambolana, *Lam.*, MYRTACEÆ. 109

Syn.—SYZIGIUM JAMBOLANUM, *DC.*

Vern.—*Jáman, jamoon,* HIND.; *Jám,* BENG.; *Chambu,* GÁRO; *Jamu,* ASS.; *Naval, naga,* TAM.; *Nasedu, nairuri,* TEL.; *Thabyebyu,* BURM.

A moderate sized tree, found wild or in cultivation all over India from the Indus eastward, ascending to altitude 5,000 feet.

The bark is used for dyeing and for tanning. In Assam it is used along with the red *Munjit* dye to impart brilliancy to the colour. In tanning it is often combined with *Garan* bark (**Ceriops Roxburghiana**). (*McCann.*)

EUPHORBIA.

Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ. 110

Vern.—*Lanka-sij,* BENG.; *Sehnd,* HIND.; *Tiru kalli,* MAL., TAM.; *Shera thora,* MAHR.; *Jemudu, kalli-chemuda, manche,* TEL.; *Shasaungbethnyo,* BURM.

A small tree, with round stems and smooth branches; cultivated as a hedge throughout India. The wood is hard.

The sap is acrid, and when thrown into the water intoxicates fish.

The ashes are used in Southern India as a mordant. **Roxburgh** says that in Madras it is very generally known as the Milk-hedge.

EXCÆCARIA.

Excæcaria sebifera, *Müll. Arg.*, EUPHORBIACEÆ.

THE CHINESE TALLOW TREE. 111

Syn.—CARUMBIUM SEBIFERUM, *Kurz*; SAPIUM SEBIFERUM, *Roxb.*

Vern.—*Mom-china,* BENG., *in Roxb. Fl. Ind.*

A small tree, with grey bark longitudinally cracked. Introduced into India and widely cultivated throughout the Northern districts.

The leaves give a black dye, and the seeds an oil. The white pulp around the seeds is the Chinese-tallow. To this genus belongs the Sunderban **Agallocha,** the sap of which is said to be poisonous, and to cause the eyes of the persons engaged in hewing down the trees to become inflamed. When dry the wood is useful, and is made into toys, bed-steads, tables, &c.

FIBRAUREA.

Fibraurea Trotterii, *Watt, MS.*, MENISPERMACEÆ. 112

Vern.—*Napoo,* MANIPUR.

An extensive climber common in the forests of Manipur. I have taken the liberty of provisionally naming this curious plant in honor of its discoverer Major Trotter, Political Agent, Manipur. Not having seen flowering specimens it is impossible to describe the plant, but only one species has been hitherto described. Major Trotter describes the process of dyeing from this plant as follows:—

Five chittacks of dry root of the *napoo* tree to be washed clear and beaten into long shreds; then soak it in 2½ quarts of water for 15 or 20 minutes, when it will be found that the water has become of a yellow colour; this water to be put aside, as it will be required later on. Take out the pounded roots and re-steep in the same quantity of fresh water and let stand for 24 hours. Then wash the cloth to be dyed clean, and thoroughly soak it in the first solution and take out and repeat the process in the

FLEMINGIA.

second water, leaving the cloth to soak in it for about half an hour; then wring out and steep in half a pint of *heiboong* (**Garcinia pedunculata**) water, pressing and flopping it about in the vessel, so that every part of it may become thoroughly saturated with this water, then wring out and dry in the shade.

FICUS.

113 **Ficus religiosa,** *Linn.*, URTICACEÆ.

THE PEEPUL TREE.

Vern.—*Pipal*, HIND.; *Ashathwa, aswat, asúd*, BENG.; *Arasa*, TAM.; *Rái, ragi, ravi*, TEL.; *Nyoungbaudi*, BURM.

A large tree, commonly cultivated along roadsides throughout India.

The bark is said to be sometimes used for tanning. The young buds are eaten in times of scarcity, and the leaves are a favourite fodder for elephants. (*Brandis.*) **Roxburgh** says the silk-worm feeds well upon this tree.

FLEMINGIA.

114 **Flemingia congesta,** *Roxb.*, LEGUMINOSÆ.

Vern.—*Bara-salpan (as in Roxb.), Bhalia (as in Gamble)*, BENG. and HIND.; *Batwasi*, NEPAL; *Mipitmúk*, LEPCHA. **Roxburgh** also gives for *var. nana* the vernacular names of *Supta, cusunt*, HIND.

An erect, woody shrub, common in the thickets and forests of the warmer parts of India.

In a correspondence recently forwarded by the Secretary of State to the Department of Revenue and Agriculture, **Sir Joseph Hooker** says that the African medicine *Waras* (Arabic name which means saffron) and the valuable silky dye of the same name are derived from the pods of this common Indian plant. **Roxburgh**, nearly a century ago, wrote of its garnet-coloured glandular hairs, but it was left to the "Dark Continent" to discover that these contained a useful dye. In the new Report for 1881, there occurs also some additional information with regard to this curious discovery. Alcohol extracts a splendid red colour from these glands.

It would be interesting to know if this dye is really unknown to the hill tribes, and to obtain any available information, specially vernacular names, and also specimens of the short, crowded legumes. I may give here a short technical description of the plant to assist identification:—

A shrubby plant, 2 to 3 feet high, like most members of the genus growing gregariously, and forming dense masses in damp forests. *Branches*, almost round. *Leaves*, trifoliolate, leaflets oblong acuminate, with white, silky hairs on the ribs below. *Flowers*, small, crowded in short racemes, often fascicled. *Calyx*, densely clothed with adpressed, pale, brown, silky hairs. *Corolla*, small, almost contained within the calyx. *Pod*, oblong, ⅜ inch long, obscurely downy, or clothed with clammy, reddish glands; two-seeded. The pods, with their short thick valves, are crowded upon the extremities of the twigs, and with their short, hairy pedicels furnish the dye.

The *Flora of British India* reduces to this species the following forms described by **Roxburgh** as distinct (see Ed. C. B. C., pp. 571-72):—

F. procumbens, F. prostrata, F. nana, F. congesta and **F. semialata,** forming four varieties:—

Var. 1.—**semialata**—Central Himálaya, ascending to altitude 5,000 feet.

Var. 2.—**latifolia**—Khásia Hills, altitude 2,000 to 3,000 feet.

Var. 3.—**Wightiana**—Nilgiris, Bhutan, Ava.

Var. 4.—**nana**—Central and Eastern Himalaya and the Concan.

Galls are growths formed upon certain plants around an insect which parasitically causes the irritation that results in the formation of these valuable economic products. 115

Oak-Galls (Quercus infectoria.)

The insect should not have escaped from the gall before use, otherwise the galls lose their strength very considerably.

Tamarix Galls.

Vern.—*Bara mai,* HIND.

The leather made with this tan is of the best description.

Terminalia Galls or Galls from the myrabolan tree. These are chiefly obtained from the leaves and twigs of **T. Chebula,** and are used in dyeing and tanning, and in the preparation of ink.

Gambier. *See* **Uncaria Gambier,** *Hunt.* [267]

GARCINIA.

Garcinia Cambogia, *Desrouss.,* GUTTIFERÆ. 116

Vern.—*Aradal,* KAN.; *Heela,* BURGHERS *(Nilgiri Hills).*

West Coast and Ceylon.

This tree yields a yellow gum, insoluble in water, but soluble in spirits. It is, therefore, likely to prove useful as a varnish, but not as a pigment.

G. Cowa, *Roxb.* 117

Vern.—*Cowa,* HIND.; *Toungthalé,* BURM.

Eastern Bengal, Assam, Chittagong, Burma, and Andaman Islands.

It is said to yield a kind of gamboge of a somewhat paler colour than that produced by **G. Morella.** *(Gamble.)*

G. eugeniæfoliæ, *Wall.* 118

Eastern Peninsula, Singapore, Malacca. *(Griffith.)*

Helfer says that the steam exudes a green varnish, and Griffith, that the juice of the fruit is milky.

G. heterandra, *Wall.* 119

Vern.—*Thanat-tau,* BURM.

Hills of Burma up to 3,000 feet.

It yields a superior kind of gamboge. *(Kurz.)*

G. indica, *Chois.* 120

Syn.—G. PURPUREA, *Roxb.* (*Fl. Ind., ii, 624.*)

Vern.—*Brindall,* GOA.; *Katambi, Amsul* and *Kokrun* (fruit), MAHR.

The fruit has an agreeable, acid flavour; a syrup is made from it. It is also used as a mordant. The seeds furnish a concrete oil called *kokúm* in Bombay.

G. Mangostana, *Linn.* 121

THE MANGOSTEEN.

Vern.—*Mengut,* BURM.

An evergreen tree, a native of the Straits; cultivated in British Burma on account of its fruit, which is pronounced the finest of all known fruits.

The rind of the fruit yields a valuable tan.

122 **Garcinia Morella,** *Desrouss.*

THE GAMBOGE TREE.

Syn.—G. PICTORIA, *Roxb.*

Vern.—*Gota gamba,* HIND.; *Makki,* TAM.; *Aradal, punar puli,* KAN.; *Gokatu,* CINGH.; *Thanattan,* BURM.

An evergreen tree, yielding the valuable substance Gamboge; the rind of the fruit, as in all other species of the genus, may be used as a tan.

GARUGA.

123 **Garuga pinnata,** *Roxb.,* BURSERACEÆ.

Vern.—*Ghogar, kaikar,* HIND.; *Júm, kharpat,* BENG.; *Gendeli poma,* ASS.; *Dabdabbi,* NEPAL; *Gia,* MECHI; *Chitompa,* GÁRO; *Kharpat, kilmira, sarota,* PB.; *Kukar, kaikra,* C. P.; *Kúráka,* MAHR.; *Kuráka, kankada,* BOM.; *Garuga, gár-gá,* TEL.; *Karre vembu,* TAM.; *Mohi,* URIYA; *Chinyóp,* BURM.

A large tree of the Sub-Himalaya, Central and South India.

The bark is used for tanning. (*Gamble.*)

GERANIUM.

124 **Geranium ? nepalense,** *Sweet,* GERANIACEÆ.

Vern. of the root as sold in bazar—*Rowli, bhand,* PB.

The root of a species of Geranium is brought from the hills and sold as a red dye, in appearance like *rattan-jot.* (*Stewart.*)

Specimens much needed to clear up the doubt regarding this dye and **Onosma.**

125 **G. pedunculata,** *Roxb.*

Vern.—*Heibúng,* MANIPUR.

Major Trotter sends the fruits of this plant which are largely used by the Manipuris to deep and render fast saffron dye.

After the cloth has been dyed with saffron wring it out and lay aside for a few minutes; add ¾ of a pint of the *heiboong* water (prepared very simply, *viz.,* by soaking ¼ a seer of *heiboong* fruit, cut in slices, in a pint of water for 20 or 24 hours) to the dye in the vessel and mix thoroughly; then steep the *Golap Machoo* (saffron) cloth in it and press and flop it about till it is thoroughly saturated, then take out and wash in clean water and hang up in the *shade* to dry.

GLUTA.

126 **Gluta elegans,** *Wall.,* ANACARDIACEÆ.

Vern.—*Thayet-thitsé,* BURM.

Found along the coast of Tenasserim.

Kurz, in his *Burmese Flora, I, p. 310,* remarks of this plant: "Wood good for furniture, and when steeped in ferruginous mud turns jet black, looking like ebony. Used for building purposes, boxes, &c., and for dyeing (with different mordants, from orange to black)."

GLYCYRRHIZA.

Glycyrrhiza glabra, *Linn.*, LEGUMINOSÆ. 127

LIQUORICE.

Vern.—*Mulatthi, jethi-madh,* HIND.; *Jasti madhu,* BENG., BOM.; *Antimaduram,* TAM.

A native of the south of Europe, largely imported into India. Dr. Dymock informs me that the Bombay supply comes from Kurrachi and Persia.

The root is used in medicine, and in dyeing to perfume the fabric and give it a finish.

Gulal, a coloured powder used along with *Abir* at the *Holi* festival. It is generally prepared from sappan wood and alum imparting colour to flower. At present day it is in Bengal largely prepared from aniline. *See* **Abir,** also **Curcuma zedoaria.** 128

Gum. The gum most employed in dyeing, or rather in calico-printing, in India is a mixture of *Babul* (**Acacia arabica**), and Gum *Bankri* (**Anogeissus latifolia**). In addition to these Mr. Buck gives the following gums as used in calico-printing :— 129

Dha, **Woodfordia floribunda,** *Salisb.*,
Piár, **Buchanania latifolia,** *Roxb.*,
Dhák, **Butea frondosa,** *Roxb.*,
Sandráo, **Vateria indica**, *Linn.*,
Mochras, **Bombax malabarica,** *Db.*
Starch, Rice-water, and Sugar (*Gurh*) are also used.

GYMNEMA.

Gymnema tigens, *W. & A.*, ASCLEPIADEÆ. 130

A climbing shrub, of the lower Eastern Himalaya, extending to Burma. The leaves give a good indigo dye. Dr. Buchanan states that it gives a green indigo like the Chinese green, but Dr. Roxburgh suggests that the cloth must be first dyed yellow. This is the second species of this order yielding indigo, the other plant being **Marsdenia tinctoria.**

HÆMATOXYLON.

Hæmatoxylon campechianum, *Linn.*, LEGUMINOSÆ. 131

LOGWOOD.

A native of Central America and the West Indies. Imported into India.

A decoction of the chips of the heart-wood is used in dyeing.

Hair dyeing or staining as practiced in India. 132

1st Process—Mix equal parts of chalk and soap and half the quantity of lime, rub in a leaden pestal and mortar until the mixture acquired a bluish colour; apply this to the hair, rubbing in, tie up the hair within a cloth for about an hour: wash; thereafter apply a paste, which has been allowed to ferment to some extent, made of wheat flour, pulverised iron filings and yeast; tie again for another hour wash in a strong infusion of galls or of *ámlá* [**Phyllanthus) Emblica)** the latter being cheaper. Thereafter apply an oil to give a gloss. The colour thus obtained is very black and perfectly fixed, being only rendered useless by the growth of the hair below revealing the original colour.

2nd Process.—Rub henna leaves on the hair and tie for an hour; wash, apply thereafter a paste of indigo or indigo leaves, wash and fix with galls or *ámlá.* This gives a bluish black, but as the indigo becomes rubbed off the henna gives the hair tips a red tinge.

HEDYCHIUM.

133 **Hedychium spicatum,** *Ham.*, SCITAMINEÆ.

Vern.—*Kachúr-kachu, kapúr-kachri,* N.-W. P., PB.

The aromatic root-stocks of this plant are often used as an auxiliary in dyeing, to impart a pleasant smell to the fabric. It is chiefly used along with *Henna* dye (**Lawsonia alba**) in preparing the cloth known in the North-West Provinces as *Malagiri.* A herbaceous plant met with in Nepal having when dry white root-stocks; sometimes confused with the yellow root-stocks of **Curcuma aromatica,** *Salisb.*

HEDYOTIS.

134 **Hedyotis capitellata,** *Wall.*, RUBIACEÆ.

Vern.—*Bakre lara,* PAHARIA; *Kalhenyok,* LEPCHA, *in Gamble's List.*

The *Flora of British India, III,* 57, says that this climber occurs only in the Malay Peninsula from Tenasserim to Malacca. **Gamble** includes it in his "List of Trees, &c. of the Darjiling District." This seems to require confirmation, especially as he describes the plant as "a soft-wooded climber of the Terai." It is plentiful upon the Burma-Manipur frontier, which may be its most westerly habitat, but it is quite herbaceous, with hollow stems, and except in the root or the portion of the stem immediately above ground, does not possess anything that could be called *wood;* the stems are in fact hollow. It is probable that **Gamble** refers to **H. scandens,** *Roxb.*, a climber of the tropical and sub-tropical Himalaya to the Khásia Hills, Chittagong and Burma.

Gamble, speaking of the plant referred by him to **H. capitellata,** *Wall.*, says that "it is used by the Lepchas as a green dye," and that "the green leaves are put into water and infused, and the cloth to be dyed steeped in the infusion." I found no trace of the use of either species as a blue dye among the Nagas; although both plants are very plentiful, they regularly import from the plains of Manipur and Assam the *room* dye (**Strobilanthes flaccidifolius**).

Dr. Schlich says of **H. capitellata,** *Wall* (see *McCann's Report on Bengal Dyes*): "The Lepchas grind up the green *leaves* and steep the article to be dyed in the infusion." "It yields a *green* dye."

From the preceding remarks, as also those under **Luculia gratissima** and **Baccaurea sapida,** it is clear that there must be some mistake regarding this dye-stuff. Fresh information, specimens of the dye-stuff, cloth dyed with it, and, if possible, dried specimens of the plant yielding the dye, are much required for identification.

HIBISCUS.

135 **Hibiscus rosa-sinensis,** *Linn.*, MALVACEÆ.

THE SHOE-FLOWER, *Eng.;* KETMI DE COCHIN CHINE, *Fr.*

Vern.—*Jobá, juwa, oru,* BENG.; *Jásavanda,* BOM.; *Joba,* SANS.; *Jasut,* DEC.; *Shappat-tup-pu,* TAM.; *Java-pushpamu,* TEL.; *Kaung-yan, koung-yan,* BURM.

A favourite ornamental bush, occurring in most flower gardens on the plains of India. There are numerous varieties, single and double red, yellow and white. The plant never seeds in India.

Dr. Bidie reports that an infusion of the flowers produces a purplish hue. The petals are also used to give a polish to boots and shoes. **Dr. McCann**, in his *Report on the Dye-stuffs of Bengal,* says the flowers are culled by children, and in Hugli are used to give a red colour to paper.

HYMENODICTYON.

Hymenodictyon excelsum, *Wall.*, RUBIACEÆ. 136

Syn.—CINCHONA EXCELSA, *Roxb.* (*Fl. Ind., i., 529.*)

Vern.—*Bhaulan, bhalena, bhamina, dhauli, kúkúrkat, bhúrkúr, phaldu, bhohár, patur,* HIND.; *Bartu, baxthoa,* PB.; *Kalákadú,* BOM.; *Sagapu,* TAM.; *Dudiyetta, chetippa, bandara,* TEL.

A deciduous tree, 30 to 40 feet high, with smooth bark, met with on the dry hills at the base of the Western Himalayas, from Garhwal to Nepal, ascending to 2,500 feet; throughout the Deccan and Central India to the Anamalays. Also in Tenasserim and Chittagong. (*Hooker.*)

The inner bark is bitter, astringent and used as a febrifuge and for tanning; and the leaves as a cattle fodder. **Roxburgh** says: "the infusion of one leaf in water all night had little colour, but struck quickly a deep purplish blue with a chalybeate." (*Gamble.*) Probably **H. Thyrsiflorum,** *Wall,* vern. *Purgur,* HIND., is used in the same way as **H. excelsum.** This striking and peculiar property of the infusion, giving a purplish blue with salts of iron, is nowhere mentioned by any subsequent author, and is apparently unknown to the natives.

HYMENOPOGON.

Hymenopogon parasiticus, *Wall.*, RUBIACEÆ. 137

An epiphytic shrub of the North-eastern Himalaya and Burma.

IMPATIENS.

Impatiens Balsamina, *Linn.*, GERANIACEÆ. 138

Vern.—*Bantil, tatura, pallú tilphár, júk,* PB.

Madden says that the flowers of this plant are in Garhwal used for a dye, whence it is called Majiti. (*Stewart.*) Specimens much required to confirm this.

INDIGOFERA.

Indigofera tinctoria, *Linn.*, LEGUMINOSÆ. 139

INDIGO.

Vern.—*Nil,* HIND., BENG.; *Nila gula,* BOM.; *Nilam,* TAM.; *Niti-mandu,* TEL.

Extensively cultivated in Bengal, the North-West Provinces, Punjab, Sind, and South India. It does not require to be specially described here, as it is already an established commercial product. The following are the more important Indian plants known to yield the chemical substance Indigo:—

Indigofera tinctoria, Bengal Indigo.
Isatis tinctoria, Afghanistan and China Indigo.

IRON SULPHATE.

Strobilanthes flaccidifolius, Assam Indigo or *Room*; also largely cultivated in China.

Marsdenia tinctoria, The Lepcha Indigo, or Ryom.

Wrightia tinctoria, The Mysore Indigo.

These are the principal plants in India known to yield the blue dye. About 100 in all are known to yield it, of which two more may be mentioned here, the common grain plant **Cicer arietinum,** and the custard apple, **Annona squamosa.**

The dye is obtained from the twigs of the former and the leaves of the latter.

140 Iron Sulphate.

Is used as a dye, or rather as a mordant, with certain organic products, which, with this salt, give a black or dark brown dye. It is generally prepared by placing clean bars of iron in a tub containing a solution of coarse sugar and other substances. There is a large trade in Lucknow in the preparation of Iron Sulphate, it being sold in large slabs to the dyer. When the solution of the iron salt and vegetable product assumes a deep dark colour it is ready for use. Sometimes myrabolans are boiled with this solution to give brilliancy. Mr. Buck, in his *Dyes and Tans of the North-Western Provinces,* gives the following colours as produced with sulphate of iron associated with organic matter:—

Black (Vern. *Paundai* of Etah).
Myrabolans.
Alum.
Washed in clean water.
Al.
Sulphate of iron.
Safflower may be substituted for al. (**Morinda bark**).

Blue Black (Vern. *Kalejai* of Allahabad).
Myrabolans.
Sulphate of iron.
Indigo.
Safflower.

Dark Green (Vern. *Zimmaraddi* of Cawnpore).
Myrabolans.
Sulphate of iron.
Turmeric.
Naspal.
Alum.
Acidulated water.

Dark Brown (Vern. *Kakresi* of Furukhabad).
Lac.
Sulphate of iron.

Brown.
Catechu.
Sulphate of iron.

Slate Grey (Vern. *Khâki* of Allahabad).
Myrabolans.
Oak galls.
Sulphate of iron.
Sulphate of iron is also largely used in calico-printing.
See also **Protosulphate of Iron.**

ISATIS.

Isatis tinctoria, *Linn.*, CRUCIFERÆ. 141

An erect, herbaceous plant, like a large cabbage, common in Western Tibet, wild and cultivated. Also largely cultivated in certain regions in China.

It yields the indigo of China, and **Dr. Aitchison**, in his report upon the Kuram Valley, informs us that it is used for this purpose in Afghanistan.

JASMINUM.

Jasminum humile, *Linn.*, OLEACEÆ. 142

Syn.—J. REVOLUTUM, *Sims.*

Vern.—*Chamba, juari, tsonu, summun, jai, kuja,* PB.; *Sonajáhi,* KUMAUN; *Sim, re,* CHENAB; *Shing, puring, marti,* SUTLEJ.

A small shrub, wild in the Sub-tropical Himálaya at 2,000 to 5,000 feet, from Kashmir to Nepal, Bhutan, South India, and Ceylon, widely cultivated in gardens throughout India.

A yellow dye is extracted from the roots in Kuram Valley (*Aitchison, Linnean Journal, XIX, p. 147*). It is curious that this fact should apparently be unknown to the hill tribes in other parts of India where the plant is equally abundant.

Specimens of the root, and of dye-stuff, much required, with any additional information.

JATROPHA.

Jatropha glandulifera, *Roxb.*, EUPHORBIACEÆ. 143

Vern—*Jangalieranda,* BOM.; *Addalay,* TAM.; *Nela-amida,* TEL.; *Nikumba,* SANS.

The above vernacular names are given by **Ainslie** in the first instance as the South India names for a plant which he called **J. glauca,** *Vahl.* This plant was referred to **J. glandulifera,** *Roxb.*, by **Drury** in his *Useful Plants of India,* and thus the above names crept into all subsequent writings as the vernacular names for **Roxburgh's** plant.

There seems to be considerable doubt as to the accuracy of **Drury's** interpretation. **DeCandolle,** in the *Prod., Vol. 15, p. 1085,* reduces **J. glauca** *Vahl.*, to **J. lobata,** *Muller,* to which there is considerable likelihood of its properly belonging. If this be correct the above vernacular names which, as stated, have found their way into the writings of all modern authors, will have to be removed from **J. glandulifera,** *Roxb.* There is a name pretty general in Bengal for the Roxburghian plant, which will be found useful, and will probably become its future vernacular name, namely, *Lal-bherenda.*

In **Roxburgh's** time this plant was "met with in a few gardens about Calcutta." "From whence it came I cannot learn:" so wrote the father of Indian Botany eighty years ago. It has now spread everywhere throughout the hotter damp parts of India, and is largely cultivated as a hedge plant like most other **Jatrophas,** because cows and goats will not eat them. *Lal-bherenda* in Bengal is perhaps one of the commonest jungle plants, and was, I am told, one of the "jungle weeds" suspected of having something to do with the great outbreak of dengue fever in Bengal.

The chief interest in this plant economically consists in the property of its leaves which give a beautiful green dye. This was discovered by **Dr. Thomson**, Civil Surgeon of Malda, and made known to the Agricultural and Horticultural Society in 1862. It is much to be regretted that this discovery has not been confirmed by other observers. The leaves have not been taken advantage of as a dye-stuff.

It is hoped that the above remarks regarding the probable confusion in the vernacular synonymy of this plant may show that the Madras plant is quite distinct from that met with in Bengal; and that the dye will be rediscovered by other experimenters and made more generally known. There are but few instances of greens being obtained as simple colours from plants, the Chinese green indigo being that best known. It seems doubtful, however, if even the Chinese green is a simple dye; I should suspect that there is some mistake regarding the dye from **Jatropha glandulifera**, *Roxb.*

Drury publishes a description of this plant, which might be supposed original. It was written, however, by an author quoted by **Ainslie**, who gives the paragraph published by **Drury** as a quotation from **Miller**. There is one important departure from the original in **Drury's** reproduction; the description of the petiole has been changed from "wthout glandular hairs" into "with glandular hairs," perhaps to fit in with the reduction to **J. glandulifera**, *Roxb.* The height of the plant is given as 1 foot, whereas **Roxburgh's** plant is described by **Kurz** as " an evergreen treelet", 4 to 8 feet in height. Not unfrequent among rubbish round villages and along river banks from Chittagong to Ava, Arracan, and Pegu. It is remarkable that in the damp jungles of Bengal, especially in the vicinity of Calcutta, where the plant is very plentiful, it rarely rises more than 2 to 3 feet above ground, being much branched and gregarious. In the N.-W. Provinces and Oudh it is not so plentiful, but forms a distinct stem 4 to 6 feet in height, and is a frequent ornamental bush in gardens. **Dr. Dymock** reports that it is a large and plentiful bush in Bombay with glandular hairs.

The seed gives a valuable oil like that from **J. Curcas**, *Linn.*

JUGLANS.

144 **Juglans regia**, *Linn.*, JUGLANDEÆ.

THE WALNUT.

Vern.—*Akhrot*, HIND., BOM.; *Akrut*, BENG.; *Girdu*, *girdugam*, *charmaghz*, PERS.; *Akhor*, KASHMIR; *Kowal*, LEPCHA.

A large tree wild in the North-West Provinces and the Sikkim Himalaya, and largely cultivated.

The rind of the fruit is used for tanning and dyeing and so also is the bark of the tree.

KANDELIA.

145 **Kandelia Rheedii**, *W. & A.*, RHIZOPHOREÆ.

Vern.—*Guria*, BENG.; *Tsjeron-kandel*, MALAY.

" An evergreen shrub, or small tree, found on the muddy shores in tidal creeks of Bengal, Burma, and the Western Coast.

The bark is used in Tavoy in dyeing red, and probably as a mordant. (*Gamble*).

146 **Kino, Bengal.**—The gum resin from **Butea frondosa**, *Roxb.*, and **B. superba**, *Roxb.*, which see.

Khaki, an earthy or grey clay colour, now largely used to dye the uniform of soldiers. "Khaki" is the name given to a sect of Vaishnava Hindus founded by Kil, a disciple of Krishna Das. They apply ashes of cowdung to their dress and persons, hence the name of *khaki* given to them. The following are the principal *khakis* or grey dyes in use: 147

1st.—Allahabad Khaki. This is produced by boiling myrabolans, gall-nuts, and sulphate of iron together.

2nd.—In many parts of the country, such as in Manipur, a natural earth is used. The *laynung* earth of Manipur seems capable of much development.

Wet a chittack of wild turmeric (*huldi*) and rinse out its colour into 1¼ quart of water; then mix two tolahs of *leingang* (a kind of earth that is to be found nearly everywhere in the valley) in the water; add ¼ of a pint of fresh milk and then strain. Wash the cloth to be dyed thoroughly clean, and then steep it in this mixture; press, squeeze and flop it about and then let it soak for half an hour. Wring out and dry (in the sun?) and when dry steep it again in the mixture as above. Wring out and steep in ¾ of a pint of heiboong water thoroughly; and wring out and dry in the shade.

Lac-dye, the colouring matter of the body of the insect **Coccus Lacca**, a by-product obtained from the washings in the preparation of seed-lac from stick-lac. These washings are evaporated, and the residual matter is baked into the dark purplish cakes sold in the market. Lac-dye might have ceased to be met with at all, since the advance of the aniline dye has caused an enormous decrease in the price of all Indian indigenous colours and dyes, but it still pays to make the dye as a by product. 148

Lac-dye is chiefly used in dyeing leather, and in combination with **Morinda** (*al*) **Rubia** (*madder*) to improve the colour of these dyes.

For a list of plants which yield the Lac insect, see "**Lac**" in *Part I*, "*The Gums and Resins.*"

LAGERSTRŒMIA.

Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ. 149

Vern.—*Bakli, jhaura, sida,* HIND.; *Śida,* BENG.; *Lahánabodara,* BOM.; *Kanhil,* LEPCHA; *Chinangi,* TEL.; *Zaungbále,* BURM.

A large, deciduous tree, met with in the Sub-Himalayan tract from the Jumna eastward to Oudh, Bengal, and Assam, and in Central and South India.

The bark is used in tanning (*Gamble*). **Dr. McCann** says that in Midnapur it is also used in dyeing skins black, along with the bark of **Terminalia tomentosa**, *Roxb.* (*asná*).

LAWSONIA.

Lawsonia alba, *Lam.*, LYTHRACEÆ. 150

Vern.—*Henna, mehndi,* HIND.; *Mendi,* MAHR., BENG.; *Marithondi,* TAM.; *Goranta,* TEL.; *Dan,* BURM.

Wild in Beluchistan, on the Coromandel Coast, and perhaps in Central India; cultivated throughout India.

The *henna* dye is used to give the nails, hair, &c., an orange colour. For this purpose the freshly-gathered leaves are pounded with catechu or lime; with indigo it is sometimes used to dye the hair black. As a dye for fabrics it is very fleeting and, therefore, rarely used.

LORANTHUS.

151 **Loranthus longiflorus,** *Dex.*, LORANTHACEÆ.

Vern.—*Bura-manda,* BENG.; *Panda, amut,* PB.; *Banda,* C. P.; *Prusti,* LEPCHA; *Ajeru,* NEPAL; *Vánda,* SANS.; *Vánda,* MAHR.; *Yelinga, wadinika,* TEL.

A common parasite upon the following trees:—

1. Albizzia.
2. Bassia.
3. Bauhinia.
4. Buchanania.
5. Diospyros.
6. Ficus.
7. Melia.
8. Mangifera.
9. Quercus.

&c.

The wood is used as a finishing tan stuff in order to give softness to leather.

LUCULIA.

152 **Luculia gratissima,** *Sweet.*, RUBIACEÆ.

Vern.—*Dowari,* NEPAL; *Simbran-grip,* LEPCHA.

Temperate Himalaya, from Nepal to Bhutan, altitude 4,000 to 6,000 feet, also in Ava. (*Kurz.*)

"Leaves are used in dyeing." (*Gamble.*)

Under **Hedyotis capitellata,** *Wall.*, Gamble alludes to this plant, but it is not quite clear whether he means the leaves of this plant or of **Hedyotis** when he says, "It seems to be more as a mordant that it is used than as a regular dye." (*Gamble's List of Trees, &c., in Darjiling District.*) Additional information and specimens required.

MACLURA.

153 **Maclura tinctoria,** *D. Don.*, URTICACEÆ.

THE MUSTIC.

A native of the West Indies and Central and South America; introduced into India.

Wood used for dyeing shades of yellow, brown and green.

MACROTOMIA.

154 **Macrotomia perennis,** *Boiss.*, BORAGINEÆ.

Met with on the Punjab Himalaya.

The root (?) of this plant yields a dye which has been confused with that of **Onosma echiodes,** *L.*, which yields the *Rattanjot.*

It would be very desirable to obtain specimens of this root as of all the others which go by the name of *Rattanjot.*

MALLOTUS.

155 **Mallotus philippinensis,** *Mull.*, EUPHORBIACEÆ.

Syn.—BOTTLERA TINCTORIA, *Roxb.*

Vern.—*Punag, tung, kishur, kamalaguri* (the dye powder), BENG.; *Kamela, kamal,* PB.; *Rohni,* OUDH; *Puroa,* LEPCHA; *Gangai,* ASS.; *Kapila,* BOM.; *Kapli, kapila,* TAM.; *Taw-thidin,* BURM.

A small tree of the Sub-Himalayan tract, from the Indus eastward (ascending to 4,500 feet) to Bengal, Central and South India, Burma and the Andaman Islands. (*Gamble.*)

The dye is obtained from the epidermal glands of the fruits, the powder formed in the interior upon the fruit becoming dry or overripe. It gives a rich red colour used in dyeing silk and wool, and does not require a mordant. **Dr. Bidie** says that the grains consist of a red substance enclosed in a membraneous sac, which is not acted upon by water, though soluble in alcohol or an alkaline solution. It gives a brilliant yellow to silk. About 80 per cent of resin is extracted from the colouring agent through the means of alcohol. **Dr. Schlich** says the roots also yield a red dye.

The bark is largely used in tanning leather in the North-West Provinces.

MANGIFERA.

Mangifera indica, *Linn.*, Anacardiaceæ. 156

The Mango Tree.

Vern.—*Am*, Hind.; *Amra*, Sans.; *Ambá, áma*, Bom.; *Maá, mangas*, Tam.; *Ghariam*, Ass.; *Mamadi*, Tel.; *Thayet*, Burm.

A densely-branched tree, wild on the Western Ghâts, the Chutia Nagpur Hills and the Naga Hills; cultivated all over India for its fruit, the *Mango*.

The bark gives a gum and the seeds contain gallic acid. The bark and the leaves yield a yellow dye not much used, but the dry unripe fruit is largely used as a mordant, especially in dyeing with safflower. The leaves are also used in tanning by the poorer classes in Oudh. (*Buck.*) The bark is in the Dacca district used in tanning. (*McCann.*)

Mangrove Bark, a valuable tan. 157

The following are the barks known commercially by this name :—

Rhizophora mucronata, *Lamk.* : **Bruguiera gymnorhiza,** *Lamk.*; and probably also **Avicennia officinalis,** *Linn.*; **Ceriops, Candolleana,** *Arn.*; **C. Roxburghiana,** *Arn.*; and **Kandellia Rheedii,** *W. & A.*

MARSDENIA.

Marsdenia tinctoria, *R. Br.*, Asclepiadeæ. 158

Vern.—*Kalilara*, Nepal; *Ryom*, Lepcha.

Gives a blue dye resembling, if not chemically the same as, indigo.

The Lepcha name "*Ryom*" is very like the Assamese "*Room*"—the vernacular for **Strobilanthes flaccidifolius,** *Nees*, Acantheceæ, a plant which also yields indigo.

MELIA.

Melia Azedarach, *Linn.*, Meliaceæ. 159

The Persian Lilac; Bead Tree.

Vern.—*Drek, bakarja, bakain, bakáyan, betáin*, Hind.; *Ghora-nim*, Beng.; *Chein*, Sutlej; *Maha limbo, malla nim*, C. P.; *Maltai-nembu*, Tam.; *Tarak vepa*, Tel.; *Ta-ma-ka*, Burm.; *Mohanimba*, Sans.; *Ban*, Arab.

A tree with smooth grey bark, commonly cultivated throughout India, and believed to be indigenous.

Dr. Bidie says the leaves contain green colouring matter—a fact which seems to be unknown in India generally.

MEMECYLON.

160 **Memecylon edule,** *Roxb.*, Var. typica MELASTOMACEÆ.

Syn.—M. TINCTORIUM, *Kaen.*; *M. umbellatum,* BURM.

Vern.—*Alli-cheddu,* TEL.; *Anjan, kurpa,* BOM.

The *Flora of British India* gives 12 varieties of this plant. It is met with in the Western Peninsula, Ceylon, Tenasserim, and the Andaman Islands.

The flowers and the leaves are used in dyeing. A cold infusion of the leaves yields a yellow dye, largely used along with Sappan wood and myrabolans. It is also used as an auxiliary with Chay-root (**Oldenlandia umbellata**) in producing a bright red dye.

MESUA.

161 **Mesua ferrea,** *Linn.*, GUTTIFERÆ.

Vern.—*Nagesar,* HIND., BENG.; *Nágchampa,* MAHR.; *Nangal,* TAM.; *Gangaw,* BURM.; *nahar,* ASS.

A middle-sized, glabrous-barked tree, met with in the mountains of Eastern Bengal, the East Himalaya, and the Eastern and the Western Peninsula, and the Andaman Islands. A very variable tree, the under-surface of whose leaves is often quite destitute of the waxy meal.

Spons' Encyclopædia says the flower buds of this plant are used in India for dyeing silk; "they were once introduced into the London market under the name of *nag-kassar,* apparently a corruption of the Hindustani and Bengali name *nagesar.*" **Dr. Dymock** writes me to say that this is quite a mistake, and that the flower-buds referred to are those of **Ochrocarpus longifolius,** which see.

162 **Mica.**

Vern.—*Abrak,* HIND.; *Abhra,* SANS.

A mineral well known because of its metallic lustre and its peculiar cleavage, splitting into thin plates.

Sometimes used in calico-printing, the particles shining in the cloth.

MICHELIA.

163 **Michelia Champaca,** *Linn.*, MAGNOLIACEÆ.

Vern.—*Champa,* HIND.; *Champa, champak,* BENG.; *Titasappa,* ASS.; *Shimba, sempangam,* TAM.; *Saga,* BURM.

A large, handsome tree, with yellow, sweetly-scented flowers, cultivated throughout India; wild in Nepal, Bengal, Assam, and Burma.

The flowers when boiled are said to yield a yellow dye, sometimes used as a base to other colours, and communicating an agreeable perfume to the fabric.

MIMUSOPS.

164 **Mimusops Elengi,** *Linn.*, SAPOTACEÆ.

Vern.—*Bukal, bohl,* BENG.; *Mulsári, maulser,* HIND.; *Bakuli, ovali,* BOM.; *Magadam,* TAM.; *Bokal mugali,* KAN.; *Kaya chaya,* BURM.

A large, evergreen tree, largely cultivated; said to be wild on the Western Ghâts, in Burma, Ceylon, and the Andaman Islands.

The bark is astringent and used in tanning. Sometimes used also as a dye-stuff, giving a brown colour in combination with myrabolans. The dye is extracted by boiling the bark

Mimusops littoralis, *Kurz.* 165

The bark yields a red dye (*Major Ford*), used in the Andaman Islands.

Mochras, or rather Mocha-ras (the sap of Mocha.) There are two substances, used in dyeing, known by this name:— 166

A mahogany coloured gum of rounded convoluted hollow pieces obtained from **Bombax malabaricum** (*shimúl*).

A heavy light mahogany coloured gum in large solid tears, pale coloured interiorly, obtained from **Moringa ptyerygosperma.**

Curiously convoluted, yellowish, opaque pieces of resinous substance, obtained from **Areca Catechu,** are known as Mochras.

MORINDA.

Morinda angustifolia, *Roxb.*, RUBIACEÆ. 167

Vern.—*Asugach*, ASS.; *Kchai-tun*, PHEKIAL; *Chenung, chengrung*, GÁRO; *Yéyo*, BURM.

An erect bush, or small tree, of the tropical Himalaya, wild and cultivated from Nepal eastward, ascending to 4,000 feet, to Assam, Khásia and Naga Hills, Chittagong and Tenasserim. May be recognised from other species by the caudate-acuminate leaves, tapering into the petiole, and fruit 1 inch in diameter or less, of 5 free and turbinate black drupes.

Bark and wood yield a good yellow dye. **Brandis** remarks: "cultivated in toungyas in Burma as a dye."

M. citrifolia, *Linn.* 168

This is sometimes called the INDIAN MULBERRY. A small tree cultivated or wild (?) throughout the hotter parts of India, Burma, and Ceylon. It may be recognised from the preceding species by the *leaves* being elliptic, acute, or obtuse, shining; *fruit*, of many drupes coalescent into a fleshy, globose head, one inch in diameter. Considerable confusion has long existed in the allied forms and synonymy of this species, but the *Flora of British India* has reduced them to the following varieties:—

Var. 1st. Citrifolia, proper as in *Roxb. Fl. Ind*, *i*, *541.* 169

Vern.—*Al*, HIND.; *Ach*, *aich* or *achhu*, BENG.; *Alá*, *bartondi*, BOM.; *Munja pavattary*, TAM.; *Ye-o*, *Nyaw kyee* or *nyau-ki*, BURM. *Suranji*, a trade name.

Supposed to be truly wild in Malacca. Largely cultivated throughout India.

This is the chief dye-yielding form, and one of the commonest and most useful of Indian dyes. The *al* bark is principally used in dyeing the cotton yarn afterwards spun into fancy borders for the garments of the poorer classes. Sometimes used to dye silk, *e.g.*, in the *Erendi* cloth; but the chief use is to dye the coarse *Kharua* cloth. The colours produced vary from reddish yellow to dark brown. The thread or fabric is previously prepared by being steeped for 3 or 4 days in powdered castor oil seeds and cow-dung with water. After washing it is soaked in a decoction of myrabolans, and afterwards in alum. It is then removed, well washed, dried, and thereafter boiled in the dye solution. It is then sized and beaten smooth with wooden clubs. (*Buck*, *Liotard*, *McCann.*)

170 **Var. 2nd. Bracteara,** *sp., Roxb. Fl. Ind., i, 544.*

Vern.—*Hurdi, huldi kung,* HIND., BENG.; *Nágakundá,* BOM.

Roxburgh regards this form as a native of Ganjam in Orissa, and **Thwaites** views it as wild in Ceylon. It is not unfrequent in the forests of the Andaman Islands (*Kurz*), and here and there in the forests of the Terai near the Tista (*Schlich*).

171 **Var. 3rd. Elliptica.**

A form from the Concan, Malacca, &c.; in point of foliage intermediate between **M. angustifolia** and **M. citrifolia.** The above varieties are cultivated but are in some localities wild throughout the hotter regions of India. "It is cultivated in Kandesh, Berar and the Deccan, and large quantities are exported from Malabar to Guzerat and Northern India." (*Spons' Enc.*)

The root-bark yields a valuable scarlet dye. The process of dyeing is tedious, and in consequence the use of this dye-stuff is rapidly disappearing through the introduction of the cheap and brilliant aniline dyes which, though fleeting, are more taking with buyers. **Mr. Buck** states that an acre will produce about 10 maunds of root, one-third of each class. He gives the following classes of the dye-stuff:—

1st class.—Thin rootlets (*Hargharka, bhara bar*).
2nd class.—Middle sized (*Lari, jharan, pachmer*).
3rd class.—Thick roots (*Pachat, ghatiya, lari*).

The *bhara* or thin thread-like rootlets yield the true dye. The thicker roots are worthless and are used for adulteration only. The *Bhara* fetch about Rs. 8 a maund, the second quality Rs. 4, and the third Rs. 2. The plant takes 3½ years to reach maturity; the cultivator therefore requires a high price, which he cannot now obtain; and as a cultivated product it seems doomed to give place to more profitable crops.

172 **Morinda persicæfolia,** *Ham.*

Vern.—*Dala hurdi,* PAHARIA; *Huldi kung,* LEPCHA.

This shrub seems to be peculiar to Burma, **Kurz** remarking that it is common in the savannah forests from Ava and Martaban down to Tenasserim. **Gamble** in his *List of Trees, Shrubs and Climbers of Darjiling,* mentions **M. lanceolata** as met with in the Terai and as yielding a good dye. There is probably a mistake in the name, as **M. lanceolata,** *Wall,* is reduced to **M. persicæfolia,** *Ham.,* a species according to the *Flora of British India* peculiar to Burma extending to Singapore and Sumatra.

173 **M. tinctoria,** *Roxb.*

This is considered by many Indian botanists to be but a wild form of **M. citrifolia,** *Linn.* It is probable, however, that **var. bracteata** is the wild form of that species, and that this is a distinct and almost entirely wild species. It may be recognised and distinguished from the preceding by the *leaves* being acute at both ends, glabrous or pubescent, bus not shining; *fruit,* of many drupes coalescent into a head, generally lest than 1 inch in diameter. The following are the forms of this species recognised by the *Flora of British India*:—

174 **Var. 1st. tinctoria proper,** as in *Roxb. Fl. Ind., i., 543.*

Vern.—*Al, ak, acha, auch,* HIND., BENG.

175 **Var. 2nd. tomentosa sp., Heyne, as in** *Kurz, ii. 60.*

Not unfrequent in the dry forests of Prome.

Dye obtained from the interior of the wood of old trees.

Var. 3rd. multiflora, s.p. *Roxb. Fl. Ind., i, 546.* 176
In Nagpore and Berar where it is called *aâl.*

Var. 4th. aspera sp., *W. & A. Prod. 420.* 177

The plant which **Roxburgh** called **M. excerta,** *Roxb.*, and which was republished by **Beddome, Kurz** and **Gamble,** is pronounced by the *Flora of British India* to be a mere sexual condition of both **M. citrifolia** and **M. tinctoria,** in which the stamens are exserted or protruding from the mouth of the corolla; it cannot therefore be regarded even as a variety. It will be observed that while **M. citrifolia,** *Linn.*, is kept up as distinct from **M. tinctoria,** *Roxb.*, in the above notes **M. citrifolia** is the form which is most frequently met with under the name of *Al* or *Ach* in a state of cultivation, and is the chief source of the dye of commerce.

Morinda umbellata, *Linn.* 178

Syn.—M. SCANDENS, *Roxb.* (*Fl. Ind., i, 548.*)

A diffuse shrub of Eastern Bengal and the Malay Peninsula, from the Khâsia Hills to Penang and Singapore, Western Peninsula, South Concan, Nilgiri Hills and Travancore mountains. In Burma it is found in the forests of Tenasserim.

Like all other members of this genus the root yields the yellow and red dye which **Mr. Baden-Powell** thinks may be the *Chay root* of the ancients. I am inclined to think that this is a mistake, as there seems no reason to doubt that *Chay root* was **Oldenlandia umbellata.** The natural dye from **M. umbellata** is a brilliant permanent yellow, which is convertible into red when mixed with Sappan wood, rivalling the madder red.

Concluding Note.

Any of the preceding species may be used as *Al* or *Ach* in the production of the red colour obtained from the roots of **M. citrifolia.** The colour is by no means a good one, not nearly so brilliant as that from safflower. It is rarely used in compound colours, but is used chiefly in calico-printing. Its consumption is purely Indian; it is believed never to have been exported to Europe. **Mr. Buck** states that in 1876-77 *Al* to the value of Rs. 2,66,226 was imported into the city of Cawnpore chiefly from Bundelcand.

MORINGA.

Moringa pterygosperma, *Gaertn.*, MORINGEÆ. 179

THE HORSE RADISH TREE.

Vern.—*Soanjna, sanjna,* HIND.; *Sujuna,* BENG.; *Segata, segavá,* BOM.; *Morunga,* TAM.; *Danthalón,* BURM.

Mr. Christy, in his *New Commercial Plants,* includes this amongst East Indian tans, the bark, according to him, being used and known under the vernacular name of *subanjuna.* As far as India is concerned this is a mistake, the plant is far too valuable as a vegetable producer to be used economically even should it possess tanning properties. The gum is one of the substances sold under the name of **Mochras** or **Mocharas** (which see) and used in calico printing.

Muriate of tin. 180

Vern.—

A mordant used for the wool yarns of the carpet manufacturer to fix the reds obtained from lac, cochineal, and the purples obtained from these in combination with Indigo.

MUSA.

181 **Musa paradisiaca,** *Linn.*, SCITAMINEÆ.

THE PLANTAIN.

Vern.—*Ngetpyaw, nga-pyi-othi,* BURM.

182 **M. sapientum,** *Willd.*

THE BANANA.

Vern.—*Kela,* HIND.; *Kalá,* BENG.

The rind of the unripe fruit of either of the preceding or of the many cultivated forms derived from them yields a black dye often used to colour leather.

183 **Myrabolans,** a term applied to the fruits of various species of **Terminalia** which see. These curiously-winged fruits are much prized as astringents in dyeing and tanning black, for which purpose they are largely exported to Europe. They also make good ink.

MYRICA.

184 **Myrica sapida,** *Wall.*, MYRICACEÆ.

Vern.—*Kaphal, kaiphal,* N. W. P.; *Káyaphala,* BOM.; *Kobusi,* NEPAL; *Dingsolir,* KHASIA.

A moderate sized tree of the outer Himalaya, altitude 3,000 to 6,000 feet; extending to the Khásia Hills and Burma.

The bark of this tree is a much-valued remedy for rheumatism, but it is occasionally used in the North-West Provinces as a tanning agent in fancy leather-work. (*Buck.*)

The bark treated with boiling water yields an abundant hard brittle extract almost exactly like kino. (*Dr. Dymòck.*)

NYCTANTHES.

185 **Nyctanthes Arbor-tristis,** *Linn.*, OLEACEÆ.

Vern.—*Hár, siháru, harsinghár, saherwa, seoli, nibari,* HIND.; *Shinghár, harsinghár, sephálika,* BENG.; *Harásingara, párijátaka,* BOM.; *Pakúra, ladúri, kúri, sháli,* PB.; *Gongo, seoli,* URIYA; *Manja-pa,* TAM.; *Seikbilu, tseit-byi-lu,* BURM.

A small shrub of Central India, ascending to altitude 3,000 feet, and extending to Bengal and Burma. Cultivated throughout India.

The corolla tubes are orange-coloured, and when severed from the limbs they give a beautiful but fleeting orange or golden dye, sometimes used for silk. It is sometimes used in combination with turmeric. Half a seer of the dried corolla tubes will dye 60 yards of silk cloth.

The leaves are used for polishing wood.

The author of the *Mahhzan-ul-Adwiya* states that the white portion of the flowers yields a purple dye known in India as *Gulkama.* He says that directions for its preparation will be found in *Karabadien-i-kabir.* (*Dr. Dymock.*)

186 **Ochre.**

The essential ingredient is peroxide of iron, whether as as anhydrous red hæmatite or the hydrated brown and yellow limonites, but there is a wide range in the proportion of this colouring matter that may be contained in a marketable 'Ochre,' from the pure pigment manufactured on a large scale at Katni by crushing the rich hæmatite ore occurring there, down to the ochreous clay (layering) largely used as a khaki dye in Munipur, although it contains only nine per cent. of limonite. These instances illustrate the great range in the mode of occurrence of this substance, from the metallic lode in very ancient rocks down to the most recent alluvial clays. The old rocks of India are peculiarly rich in ores of iron, and these have naturally affected all the later derivative formations. The basaltic formation covering so large an area of Western India is another primary source of ferruginous matter : beds of bole (a variety of ochre) are not unfrequent in it. From these stores were derived the characteristically ochrey rock known as laterite occurring so widely throughout India. Originally deposits of iron peroxides, such as those already mentioned, whether in veins or in beds, pure or mixed with clay, would in most cases yield an unlimited supply; but in a collection of ochres made promiscuously from native sources a large number would probably be of secondary origin, *i. e.*, local, and superficial decomposition products of rocks or minerals containing iron in some other state of combination. The occurrence of these small local sources would be innumerable, but the supply would of course be limited; hence the need for competent observation in each case.

OCHROCARPUS.

Ochrocarpus Longifolius, *Benth & Hook. f.*, GUTTIFERÆ. 187

Vern.—*Suringi,* MAR.; *Sura-ponna,* TEL.; *Seráya,* MAL.; *Wúndi, taringi* (male) *poone* (female), *Suringi, gardúndi,* KAN. The flower buds are known as **Tambada Nagakesara.**

A large deciduous tree of the Western Ghâts.

The dried flower-buds are used for dyeing silk; the flower-buds used in dyeing are about the size of cloves and of a red colour. **Dr. Dymock** informs me that the *Nagkesar* referred to by *Spons' Encycl.* under the name of **Uresua ferrea** was the flower-buds of this plant.

ODINA.

Odina Wodier, *Roxb.*, ANACARDIACEÆ. 188

Vern. - *Kaimil, kimúl, mowen, mohin, ginyan, kamlái, jhingan,* HIND., *Jibán, sindan harallu,* N. W. P.; *Jiyal, lohar bhadi,* BENG.; *Kaikra;* GOND.; *Simati, moya,* BOM.; *Wodier,* TAM.; *Gumpini,* TEL.; *Shimti, púnil,* KAN.; *Nabé,* BURM.

A small tree of the Sub-Himalayan tract from the Indus eastward, ascending to 4,000 feet in altitude. Forests of India and Burma. (*Gamble.*)

The bark is used for tanning.

OLDENLANDIA.

Oldenlandia umbellata, *Linn.*, RUBIACEÆ. 189

Syn.—HEDYOTIS UMBELLATA, *Lamk.*

Commercial names.—*Chay root* or Indian madder.

Vern. - *Surbuli,* BENG., as in *Dr. McCann's Dye Report, Cheri-vello,* TEL.; *Saya-wer, imburel,* TAM., as in *Roxburgh's Fl. Ind.*

From Orissa southwards to Ceylon and North Burma (*Kurz*); collected by **Griffith.** A small bush found on sandy soils.

The bark of the root gives a beautiful red dye. It is curious that this dye does not appear to be used in Bengal; the root from Orissa is entirely exported to Madras from Puri district. **Drury,** in his Appendix D, states that a much cheaper, though less durable, dye may be prepared from the bark of the root of the Deccan plant known as *cherinji*, when used with a leaf called *jagi*.

Information regarding this unknown dye much required.

It seems probable from the similarity in the word *Cherinji* with the Telugu name *cheri-vello* for the above species that the *Cherinji* may prove another species of **Oldenlandia**, and it is possible that by *jagi* is meant **Jasminum grandiflorum**, *L.*

ONOSMA.

190 **Onosma echioides**, *L.*, BORAGINEÆ.

Vern.—*Ratanjot, gausaban*, HIND.

The root is used in the Panjab Himalaya and the Trans-Indus as a dye for wool (*Stewart*) and as a colouring matter, being a good substitute for alkanet (the root of **Anchusa tinctoria**), particularly for giving a red colour to liquids.

191 **O. Emodi**, *Wall.*

Murray in *Plants and Drugs of Sind* says that the roots of this plant "make an excellent dye for wood and silk."

192 **O. Hookeri**, *Clarke.*

Alpine Sikkim; altitude 12,000 to 14,000 feet.

The *Flora of British India* states that this plant affords the best Lepcha red dye specimens, and further information would be most acceptable.

OROXYLUM.

193 **Oroxylum indicum**, *Benth.*, BIGNONIACEÆ.

Syn.—CALOSANTHES INDICA, *Bl.*; BIGNONIA INDICA, *Roxb.*

Vern.—*Ullu, arlu, pharkath, assar, sauna, shyona, karkath*, HIND.; *Mulin*, PB.; *Karam-kanda*, NEPAL.; *Kering*, GARO; *Pana, vanga, achi*, TAM.; *Pamania, pampana, dondhip*, TEL.; *Tattunúa*, C. P.; *Dhatte*, GOND.; *Tetu*, MAR.; *Totilla*, CINGH.; *Kyoungsha, ki-aung-yabin*, BURM.

A small tree on the outer Himalaya, ascending to 3,500 feet, and extending from the Jumna eastward to Bengal, Burma, Central and South India and the Andaman Islands.

The bark and the fruit are used in tanning and in dyeing.

194 **Orpiment** a corruption of the Latin term **Auri pigmentum** or golden pigment. This is the *Sulphuret of Arsenic* of the chemists and *Hartal* of the natives of India.

It is sometimes used as a yellow dye and a pigment.

PARMELIA.

195 **Parmelia kamtschadalis**, *Esch.*, LICHENES.

THE ROSE LICHEN.

Vern.—*Charila, chalpuri, charchubila, chalcahalira*, PB.

This lichen is used in calico-printing to give a perfume to the cloth and impart a rose tinge to the fabric. The average annual exportation from the hill tract between the Ganges and the Sarda is about 25 tons. (*Atkinson's Himalayan Dist.*, *778.*)

PEGANUM.

Peganum Harmala, *Linn.*, RUTACEÆ. 196

Vern.—*Spelane, karmal.* The seeds are known in the bazars as *Isband Lahouri,* PB.; *Hurmala, ispanda,* BOM.

A bush 1 to 3 feet high, much branched and densely foliaged; met with in North-West India, from Sind, the Punjab and Kashmir to Agra; distributed to Arabia, North Africa and westward to Hungary and Spain.

The seeds yield a red dye, which was formerly imported into England from the Crimea, but the European trade has declined owing to the superiority of the aniline dye. **Stewart** says the seeds were experimentally exported from the Punjab to Europe in 1866.

Specimens required from Punjab, as also further information.

PENICILLARIA.

Penicillaria spicata, *Willd.*, GRAMINEÆ. 197

Vern.—*Bajra,* PB.; *Kambu,* TAM.; *Gantelu sajjalu,* TEL.

Largely cultivated in some parts of the Punjab plains; and in high and dry tracts, south from Rawal Pindi, constitutes the chief cereal crop.

The ashes of this plant are used as an alkali in dyeing.

Peori Dye. This curious dye-stuff is obtained from the urine of cattle fed entirely upon mango leaves. It is usually met with in the bazars of the Punjab in lumps known as *Hardwari peori.* A considerable trade is carried on in this curious dye at Monghyr, where I once had an opportunity of seeing it prepared. The smell is exceedingly offensive, and even after repeated washings, the dye imparts the smell of cow's urine to cloth dyed with it. It however gives a bright yellow, and seems to be composed of magnesia and purreic acid; the latter substance may be separated by treating the dye solution with dilute muriatic acid. *Peori* is also the name applied to chrome yellow, which this substance very much resembles. Cow urine *peori* or *peri* is chiefly used as a pigment. 198

PERISTROPHE.

Peristrophe tinctoria, *Nees.*, ACANTHACEÆ. 199

Vern.—*Bet* or *Batia-rung,* BENG. ? *Ghátipittapápada,* BOM.

A common bushy plant in Bengal, occurring everywhere in the woods around Calcutta, flowering in October. It is largely cultivated in Midnapur.

It yields the red dye used to colour the *Masland* mats of Midnapore. The twigs are used for dyeing, being cut into short chips for this purpose.

It is curious that while **Roxburgh** describes this plant fully and gives it the name of **Tinctoria** he does not mention the dye obtained from it.

PHYLLANTHUS.

Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ. 200

Vern.—*Daula, ámla, aonta, ámlika, aura,* HIND.; *Amla, ambolati, amulati, alá thanda,* BENG.; *Ambal, ámbli,* PB.; *Ambari,* GARO; *Amluki,* ASS.; *Anvalá,* BOM.; *Nelli, nellekai,* TAM.; *Osirka, usri, asereki,* TEL.; *Nelli,* KAN.; *Zibyu, tnasha, ta-sha-pen,* BURM.

A moderate sized tree in the dry forests of India and Burma.

The *fruit* is the Emblic Myrabolan, used as a medicine and in dyeing and tanning. The *leaves* are also used in tanning in most parts of India along with **Terminalia, Shorea,** &c.; in fact the leaves of this plant are regarded as one of the best tans by the Bengal *chamars.* A black dye is obtained from the fruit, along with myrabolans and sulphate of iron.

201 **Phyllanthus nepalensis,** *Müll. Arg.*

Vern.—*Mowa, bakalwa, kari,* HIND.; *Gol kamela, sama, chamar kas, amblu, koámil,* PB.; *Katmowa,* GARHWAL; *Barmao,* KUMAUN; *Latikat,* NEPAL.

A small tree of the outer Himalayas from the Indus eastward.

The bark is used for tanning.

[186] **Pigment.** *See* **Ochre.**

PINUS.

202 **Pinus longifolia,** *Roxb.,* CONIFERÆ.

Vern.—*Chil, chir, chira,* PB.; *Salla, sapin, kolan,* GARHWAL and KUMAUN.

A large, gregarious tree of the drier Himalayan slopes, met with as low down as 2,000 feet and ascending to 7,000 feet. From Afghanistan eastward to Sikkim and Bhutan.

The bark is used for tanning; the charcoal of the leaves, mixed with rice water, forms ink.

203 **P. Kasya,** *Royle.*

This is a doubtfully distinct species from the preceding; it is met with in the vicinity of Manipur; altitude 2,000 feet.

It has the same properties as the preceding.

PIPER.

204 **Piper Chaba,** *Bl.* (*? W. Hunter in Roxb. Fl. Ind.*), PIPERACEÆ.

Vern.—*Chaie choi, chaikath* (*McCann*), BENG.; *Chab,* HIND.; *Chavika, chuve,* SANS.; *Kankola,* BOM.

Introduced into India in 1808 (*Voight*)., r. McOann in his *Report on the Dyes of Bengal,* states that at Balasore the roots and twigs of this plant are used along with Sappan wood to give a brownish-red dye.

PISTACIA.

205 **Pistacia integerrima,** *J. L. Stewart,* ANACARDIACEÆ

Vern.—*Kaka, kakkar, kangar, tunga,* PB.

A tree with rough bark, met with on the Sulaiman range, the outer North-West Himalaya, extending eastward to Kumaun, altitude 6,000 feet.

The galls are used in medicine and for tanning and dyeing.

206 **P. vera,** *Linn.*

THE PISTACHIO NUT.

Vern.—*Pista,* BENG., HIND., & BOM.

Balfour says the galls of this tree are known as *gul-i-pista* or *bozaganj,* and that they are used as a dye for silk. The galls and the pericarp of the fruit are imported into Bombay from Persia in considerable quantities. (*Dr. Dymock.*)

PLECOSPERMUM.

Plecospermum spinosum, *Trecul,* URTICACEÆ. 207

Vern.—*Mainakat-lara, maidal-lara,* NEPAL; *Gumbengfong,* MECH.; *Koriti,* TEL.

A large, thorny shrub, met with on the Salt Range, in Rohilcand, Nepal, Sikkim, South India and Ceylon.

The wood is used in the Darjeeling Terai to give a yellow dye. (*Gamble.*) Often used along with **Symplocos racemosa** and turmeric.

POLYGONUM.

Polygonum tortuosum, *Don.,* POLYGONACEÆ. 208

Vern.—*Nialo* or *Niala,* PB.

Stewart says this species, which grows at altitude 15,000 feet in the Punjab Himalaya, yields a yellow dye used in Lahoul.

Specimens required from the Punjab, with further information.

POTENTILLA.

Potentilla nepalensis, *Hook.,* ROSACEÆ. 209

Vern.—*Rattanjot.*

A small, procumbent plant, not uncommon in the Himalaya, altitude 6,000 to 7,000 feet.

Stewart says it is one of the substances which yield the red dye *rattanjot.*

PROSOPIS.

Prosopis pallida, *Kunth.,* LEGUMINOSÆ. 210

ALGAROBA.

A native of South America, which **Gamble** says has been successfully grown in Ceylon.

The pods contain as much as 90 per cent. of tannic acid, highly valued in tanning, and imported into Europe under the name of **Algarobilla** (*Spons' Encyc.*) and **Balsamocarpon** (*Gamble*). This substance is also obtained from **P. glandulosa,** *Sorr.,* a native of Western Texas, known as the **Algaroba** of Texas.

P. pubescens, *Benth.* 211

Is being experimentally cultivated in the Royal Botanic Gardens, Calcutta. It is a native of Texas and New Mexico.

The bark of this yields a tan.

P. spicigera, *Linn.* 212

Vern.—*Jhand, khar,* PB.; *Kandi, samada, sami,* SIND; *Semru, hamra,* GUZ.; *Shami,* BENG.; *Perumbe, jambu,* TAM.

A moderate sized tree in the north and south dry zones of India; Punjab, Sind, Rajputana, Guzerat, Bundelcand and Deccan.

The bark is used as a tan.

213 **Proto-sulphate of Iron.**

GREEN VITRIOL.

Vern.—*Hirakosh, kasis,* HIND., BENG.

A mineral, found in many parts of India.

Largely used as a dye-stuff or as an auxiliary or mordant to vegetable colours, deepening the shade. To produce black it is used with **Terminalia** (Myrabolans), **Phyllanthus**, &c.; and to produce grey, with Sappan pods or with babul bark. *See* **Iron Sulphate** and **Ochre.**

PSIDIUM.

214 **Psidium Guava,** *Raddi,* MYRTACÆ.

THE GUAVA TREE.

Vern.—*Amrût, amrûd,* HIND. & N. W. P.; *Péyara,* BENG.; *Peru,* BOM.; *Amuk,* NEPAL; *Modhuriam,* ASS.; *Segapu,* TAM.; *Jama, coya,* TEL.; *Malaka,* BURM.

A small, evergreen tree, introduced from America, now widely cultivated, and in some parts of Bengal naturalised.

The leaves are said to be used in Assam for dyeing. (*Gamble.*) They are occasionally used in tanning in Bengal and North-West Provinces, by the poorer class, along with mango leaves, or with the *mahwa* leaves, or by themselves.

Further information regarding this fact much required, as it seems unknown in the rest of India.

PTEROCARPUS.

215 **Pterocarpus Marsupium,** *Roxb.*, LEGUMINOSÆ.

GUM KINO.

Vern.—*Bija, bijasar, bijasal, salbia,* HIND.; *Byasa,* URIYA; *Bibalá, honi, ásana,* BOM.; *Kan, damiruga-mirattam, vengai,* TAM.; *Gandumrugam-nettura, peddagi, pedei,* TEL.

A large tree of Central and South India, extending northward to Banda in the North-West Provinces; often cultivated in gardens.

This yields the gum **Kino** known in Europe for upwards of a century; it is the dried juice which exudes copiously for days from artificial cuts on the stem when artificially wounded. This gum is sometimes used as an auxiliary in dyeing and tanning, and the heartwood, saturated with it, may be used to give a yellow dye.

216 **P. santalinus,** *Linn. f.*

The SANDERS RED or RED SANDERS TREE, sometimes also called RED SANDAL WOOD, *Eng.*; SANTALE ROUGE, *Fr.*; ROTHES SANDELHOLZ, *Ger.*; SANDALO ROSE, *It.*; SANDEL-HOUT, *Dan.*

Vern.—*Lal-chandun, undum,* HIND., DEC.; *Rakta-chandan,* BENG.; *Lálachandana, ratánjli,* BOM.; *Shen-shandanum,* TAM.; *Erragandhapu-chekka,* TEL.; *Kuchandana, tilapari, rajana, rakta-chandana,* SANS.; *Sun, dul-surkh, undum,* PERS.; *Sundal-ahmer, undum,* ARAB.

A small tree of South India, chiefly in Cuddapah, North Arcot, Karnul and other dry forests; cultivated in Bengal and other parts of India.

The wood is used as a dye-stuff, and is largely exported from Madras to other parts in India. It is chiefly used to "mark idols and the forehead in ceremonies." The colouring principle is called "**Santalin.**" It is soluble in alcohol, and is sometimes used to dye cloth, imparting a pale ink colour.

PUNICA.

Punica Granatum, *Linn.*, LYTHRACEÆ. 217

THE POMEGRANATE. GRANADES, *Fr.;* GRÂNATS, *Germ.*

Vern.—*Anár, dárim, dámú,* HIND.; *Dálim,* KUMAUN; *Anára, dálimba,* BOM.; *Madalaich-chedi,* TAM.; *Danimma-chettu,* TEL.; *Darakhtenar,* PERS.; *Shajratur rumman,* ARAB.; *Thale,* BURM.

A small tree, or a large shrub, wild in some portions of the North-Western Himalaya, cultivated throughout India.

The flowers are said to be used in Bellary to give a red dye (*Dr. Bidie's Paris Exhib. List*). The flowers give a light red dye. (*Gamble.*) The rind is astringent, and is a valuable tan. It is often used as a dye auxiliary, especially with turmeric or indigo. It is said to be used in the tanning of morocco leather, imparting to it the characteristic colour. **Dr. McCann**, in his *Report of the Dyes of Bengal,* says the "bark (? rind) gives a yellow, or with alum and **Cassia Fistula**, a red dye," and **Babu T. N. Mukherji**, in his *Amsterdam Exhibition Descriptive List,* says the fruit rind (*náspal*) "is largely employed, dyeing cloth a greenish colour." **Mr. Buck** also says it gives a greenish decoction.

QUERCUS.

Quercus Ægilops, *Linn.*, CUPULIFERÆ. 218

VALLONEA OAK.

Obtained chiefly from Asia Minor under the name of *Vellani, Vallonea.*

The cupule or involucre of the acorn of this species is largely used in dyeing and tanning in Europe, and probably reaches India.

Q. Ilex, *Linn.* 219

THE HOLLY-LEAVED OAK; HOLM OAK.

Vern.—*Chúr, keharsu, dú, yúru, heru, ban,* PB.; *Charrei, serei, balút,* AFG.

A middle-sized tree or large bush, met with in Europe and on the Himálaya, and discovered by me as far east as Manipur.

It is probable that some of the galls of the Punjab are the produce of this species. The bark is good for tanning and used in France.

Q. infectoria, *Oliver.* 220

THE DYERS' OAK OR GALL.

Vern.—*Májuphala (galls),* BOM.; *Máyá,* SIND.

This is a native of Greece, Bosnia, Asia Minor and Syria.

It has long cylindrical acorns, the leaves are grey underneath and yield the galls used in medicine and in dyeing; imported into Europe from the Levant.

Q. lamellosa, *Sm.* 221

Vern.—*Shalshi, pharat-singhali, budgrat,* NEPAL; *Buk,* LEPCHA.

A large, handsome tree, with broad, serrate leaves, silvery below, with many regular parallel veins, met with in Nepal and eastward to Sikkim, Bhutan, Naga Hills and the mountains on the Burma-Manipur frontier.

In Darjiling the bark is used for tanning.

222 **Quercus pachyphylla,** *Kurz.*

Vern. – *Bara, katús,* NEPAL; *Hlosiri,* LEPCHA.

An evergreen tree, on the higher ranges of Sikkim, altitude 8,000 to 10,000 feet. Everywhere in Manipur forests, descending to much lower altitudes than in Sikkim; in the higher altitudes in Manipur it becomes a bush.

Acorns, enormous agglutinated masses or clusters of three nuts, aggregated into spikes two or three times the size of the human hand. The bark and the acorns are said to be used in dyeing and tanning. If this be correct the Naga Hills could give an unlimited supply.

From the material at my disposal I am unable to identify any of the Indian oak-galls, and this fact will, I hope, suggest the desirability of an effort being put forth to look into this matter. It seems strange that in a country possessing from 30 to 40 species of oaks we should annually import large quantities of galls and tanning acorns. In Manipur **Q. serrata,** *Thurst,* **Q. polystachya,** *Wall,* and **Q. mespilipolia,** *Wall,* cover miles upon miles of the low hills from one end of the State to the other. **Q. fenestrata,** *Roxb.,* **Q. Griffithii** *H.f. & T.,* **Q. microcalyx,** *Kunth,* and **Q. spicata,** *Sm.,* occur here and there throughout the same tract, ascending to about 4,000 feet in altitude. In the higher forests **Q. pachyphylla,** *Kurz,* **Q. dealbata,** *Hook. fil.,* **Q. lamellosa** *Ham.,* and **Q. Ilex.,** *L.,* are nearly as plentiful. The oak forests of the Naga Hills and Manipur might supply the world with tanning acorns, barks, or galls, for there are perhaps 20 species more or less plentiful, some of which seem likely to afford the economic products required if they are systematically looked into.

RANDIA.

223 **Randia dumetorum,** *Lam.,* RUBIACEÆ.

Vern.—*Mainphal, manyúl, karhar, arar,* HIND.; *Mindla, mandkolla,* PB.; *Maidal, amuki,* NEPAL; *Panji,* LEPCHA; *Pativa,* URIYA; *Gelaphala,* MAHR.; *Madu-karray,* TAM.; *Manda,* TEL.; *Kare,* KAN.

A small, thorny shrub, common on the Himalaya, from the Chenab eastward.

The bark and rind are regarded as valuable medicines, the latter as an emetic; the fruit is used to poison fish, and when roasted it is eaten. **Mr. Buck** says that in the North-West Provinces the fruit is used in calico-printing, and in dyeing as a colour intensifier.

We have as yet no specimens of this plant.

RHEUM.

224 **Rheum Emodi,** *Wall.,* POLYGONACEÆ.

RHUBARB.

Syn.—R. MOORCROFTIUM, *Meisn.*; R. RIBES, *Linn.*

Vern.—*Reuchini,* BENG.; *Dolu,* HIND.; *Archu,* GARHWAL; *Chutial, pambash, atsu, artso, chukri, rawásh,* names on the Punjab Himalaya and in Afghanistan.

In the bazars the leaf-stalks are called *ribás* and the root *rewand chini.* **Moorcroft** (*Stewart, Punjab Prod.*) says that the Bhutias of Garhwal apply the powdered root to wounds and bruises, and that they use it with *Manjit* (*Madder*) and potash for dyeing red. The colour would be derived from the **Rubia** and the Rhubarb probably plays the part of an auxiliary.

RHIZOPHORA.

Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ. 225

THE MANGROVE TREE.

Vern.—*Bhara*, BENG.; *Kamo*, SIND; *Upoo-poma*, TEL.; *Byu*, BURM.; *Kadol*, CINGH.

A small tree, frequent in the tidal forests from Arracan and Pegu to Tenasserim, and on the tidal shores of West India and the Andaman Islands.

The bark is good for tanning. This tan **Christy** recommends to be used as a preliminary preparation for cheap leathers. These should be about half prepared in India and exported to Europe in that condition, to be redone and have the colour improved by myrabolans or other tanning materials.

Mangrove Bark has been exported to Europe, but leather prepared with it is always inferior in colour and quality. Except therefore as a preliminary tan, or in the preparation of cheap leathers, it is not likely to become an article of European trade.

RHUS.

Rhus Cotinus, *Linn.*, ANACARDIACEÆ. 226

Vern.—*Paán, bhán, manu, túng*, PB.; *Túnga, chaniát, ámi*, N. W. P.; *Erandi*, MAHR.

A shrub or small tree, a native of the Sulaiman Range and the North-Western Himalaya to Kumaun.

This is nearly allied to the *Sumach* (**R. coriaria**, *Linn.*) of Europe, the leaves of which are used in tanning morocco leather. On the Himalaya the bark and the leaves of **R. Cotinus**, *Linn.*, are similarly used for tanning. **Dr. Aitchison**, speaking of the *Flora of the Kurum Valley* (*Journal of Linnæan Soc., XIX, p. 141*), says: " I was informed that the old wood of **R. Cotinus** is used as a dye for wool-stuffs, chiefly used in making felts of an orange-red colour."

See also **Sumach.**

R. succedanea, *Linn.* 227

Vern.—*Tatri, arkol, nurku*, PB.; *Kakadashingi* (the galls), BOM.; *Rani-walal*, NEPAL; *Serhnyok*, LEPCHA.

Himalaya, from the Jhelam to Assam, and the Khásia Hill.

The curious greenish-brown purse-like galls are imported into Bombay. They are very astringent. (*Dr. Dymock.*)

RICINUS.

Ricinus communis, *Linn.*, EUPHORBIACEÆ.

THE CASTOR OIL PLANT OR PALMA CHRISTI. 228

Vern.—*Rand, arand, arendi, ind*, HIND.; *Aneru*, CHENAB; *Harnauli*, SALT RANGE; *Orer*, NEPAL; *Sittamunuk*, TAM.; *Amadum, amdi, sittamindi*, TEL.; *Kyek-su-pen, kyetsu*, BURM.

A large shrub or small tree, indigenous in Arabia and North Africa; cultivated throughout India, and often found run wild.

Seeds are used by the dyers to mix with colors and render them permanent.

RUBIA.

229 **Rubia cordifolia,** *Linn.*, RUBIACEÆ.

THE INDIAN MADDER.

Vern.—*Manjit,* HIND.; *Manjistha,* BENG.; *Manjitti,* TAM.; *Tamravalli,* TEL.; *Manjushta,* KAN.

A small, herbaceous creeper or climber, often growing in festoons over the neighbouring vegetation in masses of 6 to 8 feet in length. There are two easily recognised primary forms met with in India. During the Burma-Manipur Boundary Commission, I observed that one of them yielded the red colouring matter more freely and more abundantly than the other. On returning to Calcutta I found this observation fully confirmed on referring to the excellent set of sheets in the Herbarium of the Royal Botanic Gardens. All the sheets bearing specimens of the better dye-yielding form were coloured through and through, while only one sheet of the other form showed the slightest tendency to discolour the paper upon which it was mounted. In fact, in this respect the true Madder (**R. tinctorium**) seemed inferior to the dye-yielding form of **R. cordifolia.**

230 **Var. 1st, Cordifolia,** proper.

Diagnostic Characters.—*Leaves,* four in a whorl, more or less cordate *on petioles* not more than 1 inch long; generally five costate, rarely three, veins impressed; surface rough or hispid.

This is the form chiefly met with on the Himalaya, appearing near the Chenab and extending eastward to Sikkim and Bhutan, altitude 8,000 feet, to the Khásia and Naga Hills, Burma, South India and Ceylon. It seems nowhere to be cultivated, but is largely collected as a wild dye-stuff and carried to the plains to be sold. The root and lower or ground twigs are the dye-yielding portions. This form I regard as inferior in dye-property, although it is the one generally used in India and sold as Madder.

231 **Var. 2nd, Khasiana,** *Watt, MS.*

Diagnostic Characters.—*Leaves* on petioles, generally 1, 1½ or 2 inches long; three costate, rarely five, often almost with solitary mid-rib, smooth not hispid, and veins not impressed.

This form is the richest in Madder dye-principle. It is occasionally met with in Sikkim, but attains its greatest development eastward in the Khásia and Naga Hills. It seems nowhere to be met with to the west of Sikkim. I repeatedly collected this form and compared it with the true **R. cordifolia,** thinking that it would probably be found to possess characters sufficient to justify its entire separation from **R. cordifolia,** if not its identification with **R. manjista,** *Roxb.* But while arriving at the conclusion that it was probably only a variety of **R. cordifolia,** I satisfied myself as to its superior dye-yielding property. I had been struck with the perfection of the red dye with which the Nagas colour the hair decorations of their spears, &c., and I at first concluded that this was the plant from which they obtained it. I was soon after convinced, however, that neither of these supplied the favourite red, but a third plant which I was shewn, namely, **R. sikkimensis,** *Kurz.* Before proceeding to discuss this interesting discovery, I venture to repeat my conviction that **var. khasiana** is a far richer dye-yielding plant than the ordinary **R. cordifolia.** I am inclined to suspect that the experiments, which were once made with a view to discover whether **R. cordifolia** in a cultivated form could compete with the European Madder, may have failed because this inferior variety was experimentally cultivated. If it happened that a

RUBIA.

consignment of **var. khasiana** reached Europe, it is likely that its richness in dye-property suggested the idea that the cultivation of **R. cordifolia** would be as profitable as that of **R. tinctorium**, and that disappointment followed from experimenting with the ordinary North-West Himalayan form. These remarks are, however, mere suggestions made in the hope that some additional information may be elicited from Eastern Bengal.

The inferior form is that met with on the Nilgiri Hills. It would be interesting to know from Madras to what extent **Rubia cordifolia** is used in that Presidency. The process of extracting the colour would also be interesting. Information might also be obtained regarding the cultivation of the plant or its importation from other parts of India.

Rubia sikkimensis, *Kurz.* 232

Diagnostic characters.—An extensive sub-woody climber; *branches* retrorsely scabrid; *leaves* 3 to 6 by 1 to 2 inches, *sessile, or nearly so,* 4 in the whorl, elliptic or ovate lanceolate, 3, rarely 5, costate.

This is the largest and the most handsome species in the genus, growing along the ground or over bushes and small trees, with branches often 3 to 4 yards long, and the whorls of leaves as much as a foot apart. It makes its appearance in Sikkim, but attains its greatest development in the Khásia and Naga Hills, where it is perhaps the most common species. Apparently the Lepchas of Sikkim do not know that this plant yields the Madder dye, but I suspect that the thick heavy roots (many times thicker than the roots and twigs of **R. cordifolia**) which are sold in the bazars, belong largely to this species, though probably used as an adulterant. This seems to be strengthened by the fact that until 1874 the plant was not named or even known to exist. Specimens had of course been collected, but they escaped attention, having remained for many years in the larger Herbaria unpublished. In the Naga Hills and in Manipur this species alone supplies the brilliant red dye used by the hill tribes to colour their cloths, hair decorations for spears, shields and earrings, rings, &c., as well as to colour their cane and bamboo plaited work.

The process of extracting the dye is curious. It was shown to me after considerable trouble. A woman came one morning to the Residency, Manipur, bringing with her the following things:—

1st. Two or three bundles of the root and stem of **R. sikkimensis**, *Kurz.*

2nd. A slab of the bark of **Quercus fenestrata**, *Roxb.*

3rd. A bundle of twigs and leaves of **Symplocos racemosa**, *Roxb.*

4th. A packet of seed and a specimen of the plant yielding these seeds, which I identified as **Leucas cephalotes**, *Spreng*, a Labiate plant common in fields throughout India, and in Bengal. I have been told it yields an oil used for illuminating purposes. I can, however, find no mention of this oil in works on Indian Economic Botany, and I shall be greatly pleased to learn if other observers have noted this property, as it seems to be intimately associated with the separation of the Madder from **R. sikkimensis**. In Bengal **Leucas cephalotes** is generally known as *bura-hul-khusa,* and in Madras as *gurosatumi*, Tel. (see *Roxb. Fl. Ind., Ed. C.B.C., p. 461*, **Phlomis cephalotes**, *Kon).* See concluding para. where **Perilla ocimoides** is used in place of **Leucas.**

5th. Two skeins of cotton thread, one of which was of a yellow colour and had been prepared beforehand by a process which I was to see applied to the second one. It had been steeped in some mordant or metallic salt.

6th. Two earthen vessels.
7th. A small basket.

I was told that it was necessary first to prepare the second skein of cotton, so as to give it time to dry in order that it also might if possible be dyed. The woman sat down and set fire to the bundle of twigs and leaves of **Symplocos racemosa.** When completely burned to ashes, these were carefully collected and placed in the corner of the basket and a little water sprinkled over and allowed to soak for a few minutes, then more water was sprinkled, until ultimately a yellowish liquid began to strain through and trickle into one of the earthen vessels. This liquid tasted bitter and no doubt contained some alkali salt which I have not as yet had time to identify chemically. When enough liquid had thus been obtained the second or unprepared skein of cotton was placed in the vessel and boiled for some time; after which it was removed, wrung out, and hung up to dry.

The second process was then proceeded with. The woman and her assistants commenced to pound the chips of **Rubia** using about equal proportions of root and stem. When this had been done the powder was mixed (about ½ as much as powdered madder) with a handful of the seeds of **Leucas** and intimately combined and rubbed together by the hand on a stone. This mixture was then placed in the other earthen vessel and boiled with about three proportions of water to one of the mixed powder. When boiling, the prepared skein of cotton was plunged into the solution, which was now of a deep red colour. It was turned round and round in the boiling liquid upon the extremity of a small twig held in the hand, and when dyed to the required depth it was removed and allowed to strain off the surplus liquid. Thereafter it was washed several times and hung out to dry.

I asked what was the use of the bark (**Oak,** 2nd) and was told that it was for deepening the colour from red to brown of the darkest possible shade. A few pieces were thrown in, and the skein of cotton prepared in my presence was treated as before, when a beautiful red-brown colour was the result.

I have gone into detail on the process of dyeing from **R. sikkimensis,** because I am assured by many distinguished authorities that it has been reported as not yielding Madder dye, and because the process described seems to be known to the hill tribes of Assam and the Naga Hills only. I trust that this preliminary account may suggest the lines upon which a more thorough investigation should be instituted by the authorities in Assam, and I shall have much pleasure in identifying the auxiliaries used in other parts of the Province if I am favoured with specimens. This would enable me to perfect and complete the account of the Naga Madder.

I suspect that the bulk of the Madder plant of Assam will be found to be derived from **R. sikkimensis** instead of from **R. cordifolia,** and that a considerable proportion of the Madder exported from Sikkim is derived from this plant also.

Since writing the above I have had the pleasure to receive from my friend **Major Trotter,** Political Agent Manipur, a most interesting account of the dyes and process of dyeing in practice in Manipur. I wrote specially asking that he should investigate the subject of the beautiful madder red in order to confirm my own observations. Greatly to my delight I had the pleasure to receive a most interesting series of specimens, amongst which were some 30 good specimens of **Rubia sikkimensis** putting an end to any doubt as to this plant being the source of the Naga red instead of the equally abundant **R. Cordifolia.** Instead of **Leucas Cephalotes** however, **Major Trotter** sends me the seeds of **Perilla ocimoides,** *Linn,* another **Labiateæ** as the dye auxiliary. Perhaps both plants are used, the action being similar to the use of oils in the extraction of other dyes such as saffron.

Rubia tinctorium, *Linn.* 233

THE EUROPEAN MADDER.

Diagnostic characters.—Leaves subsessile, 4 to 6 in a whorl, elliptic or lanceolate, *penni-nerved* 2-4 by ½-1½ in acuminate margins, and nerves beneath prickly.

The venation is so distinct from the 3-5 sub-parallel nerved condition of the preceding species, that a glance at the feather-veined form of this species would be enough to enable any ordinary observer to say for certain whether the Madder he was examining was the true European plant or the Indian **cordifolia** or **sikkimensis**. It is believed that this plant is much more extensively cultivated than we have any actual evidence of at present.

Cultivated in Kashmir, Sind (*Flora of British India*), and distributed to Afghanistan and westward to Spain wild or cultivated. **Dr. Aitchison** says that the roots of **R. Kotschyi,** *Boiss,* are used to colour the hard-boiled eggs used by the Afghans at some (Mahomedan) festivity. This plant is referred to here because Afghanistan being viewed as outside the boundary of India geographically and botanically, it does not fall within the scope of the present enumeration of Indian indigenous or imported dyestuffs. The interest in **Aitchison's** remarks on this subject is that while **R. cordifolia** is described as "a very common weed in the hedges all over the country, always in damp localities, from Kurum to Alikhel," it is not the Madder-dye-yielding plant of these regions. This fact seems to support the opinion given regarding the form of **R. cordifolia** met with on the western half of the Himalaya. **Stewart's** remarks in his *Punjab Plants* would almost lead one to the same conclusion, for he affirms that **R. tinctorium,** *Linn.,* is the dye-yielding species of the Punjab Himalaya, being cultivated in the upper Sutlej valley at Kanáwar, beyond the Indus in Gandáva, and abundantly at Kábul. He further states, speaking of **R. cordifolia,** that he was told that this species was cultivated in Kashmir, but came to the conclusion that this must be a mistake, as **R. tinctorium,** while it does unquestionably "yield dye" in some parts where it is common (wild), it is not used, but other substances are used, for dyeing reddish-brown.

If I am correct in surmising that certain forms of **R. cordifolia** yield dye better than others, this would point to the advisability of instituting a systematic enquiry into the forms met with in each province, if not in each district in India.

Saffron. *See* **Crocus sativus,** *Linn,* IRIDEÆ. [ ]

Salix tetrasperma, *Roxb.,* SALICINEÆ. 234

Vern.—*Bed, bent, baishi,* HIND.; *Pani jama,* BENG.; *Laila,* N. W. P.; *Bilsa,* OUDH; *Bis, beis, bitsa, magsher, safedar,* PB.; *Yir,* KASHMIR; *Bhesh,* GARO; *Bhi,* ASS.; *Bacha, wallunj,* BOM.; *Mo-ma-kha,* BURM.

A moderate sized tree, common on river banks throughout India, ascending the Himalaya to altitude 6,000 feet. **Kurz** reports that it is freuent along the hill-streams from Ava and Martaban to Tenasserim.

The bark is used for tanning. (*Kurz.*)

235 **Salts,** used in dyeing and tanning are the following:—

Common salt—largely used in tanning.
Sulphate of Iron.
Sulphate of Soda—*kheri-nún.*
Sulphate of Potash.
Carbonate of Soda.
Carbonate of Potash.
Saltpetre *(Potassium Nitrate).*
Lime.
Alum.
Sal-ammoniac *(Nisádal).*
Proto-sulphate of Iron *(hirakash).*
Sulphate of Copper, Blue Vitriol.

SALVADORA.

236 **Salvadora oleoides,** *Linn.*, SALVADORACEÆ.

Vern.—*Kabbar, jhár, diár,* SIND.; *Jal, vani,* PANJ.; *Jhal,* HIND.; *Khánkhina,* BOM.; *Ughai, koku,* TAM.

A large, evergreen shrub of the Punjab, often forming the greater part of the vegetation of the desert.

The galls found upon this plant are used in dyeing.

SEMECARPUS.

237 **Semecarpus Anacardium,** *Linn, f.*, ANACARDIACEÆ.

MARKING NUT.

Vern.—*Bhilawa, bheyla, bhalia,* HIND.; *Bhalai,* NEPAL; *Bhela, bhelatuki,* BENG.; *Bhallia,* URIYA; *Bawaræ,* GARO; *Bhilavan,* DEC.; *Bibba,* MAHR.; *Shaing, shayrang,* TAM.; *Jiri, jidi,* TEL.; *Che,* BURM.; *Hab-ul-kalb,* ARAB; *Biladur,* PERS.

A deciduous tree, met with in the Sub-Himalayan tract from the Sutlej eastward to Chittagong and Burma, ascending to 3,500 feet in altitude.

The pericarp of the fruit contains a bitter and powerfully astringent principle, universally used for marking ink, hence this is called the "Marking Nut." It is commonly made into ordinary ink, which is improved by the addition of lime water. **Dr. McCann** reports that in Balasore it is used as a black dye. As marking ink the colour is fixed by the addition of a little quick-lime (*Liotard*).

"Pounded and boiled in rape oil, it (the fruit) makes an excellent remedy for staying putrefaction when begun in a hide." (*Buck, Dyes and Tans of N.-W. P.*)

SHOREA.

238 **Shorea robusta,** *Gaertn.*, DIPTEROCARPEÆ.

Vern.—*Sál, sála, salwa, sákhu,* HIND.; *Sakwa,* NEPAL; *Teturl,* LEPCHA; *Bolsal,* GARO; *Koroh,* OUDH; *Sarei, rinjal,* C. P.; *Gugál,* TEL.

A tall, sparsely-branched, deciduous tree, often so crowded and gregarious to have long straight stems with only a terminal tuft of branches. One of the most valuable timber trees of India.

Dr. McCann, in his *Report of Dyes and Tans,* compiled from the records of the Bengal Economic Museum, states that in Chutia Nagpur the bark is used for the preparation of a red and a black dye.

STROBILANTHES.

The bark has long been used as a tan, and it is to be feared that in dyeing it is more used as an auxiliary than as a dye-yielding stuff. As a tan it is much valued, being generally used along with **Terminalia, Mimusops** and **Phyllanthus**, or with, in addition, the bark of **Ficus religiosa**, the babul (**Acacia arabica**), and the mango.

SOYMIDA.

Soymida febrifuga, *Adr. Juss.*, MELIACEÆ 239

INDIAN RED WOOD.

Vern.—*Rohan*, HIND.; *Rohina*, BENG.; *Sohan*, URIYA; *Soimi*, GOND; *Royta*, BHIL.; *Shem*, *wond*, TAM.; *Sumi*, TEL.

A large, deciduous tree of Central India and the Deccan.

The bark is bitter and used in the treatment of diarrhœa and dysentery, and often used as a febrifuge instead of quinine by the natives. The bark has also been used in tanning.

STROBILANTHES.

Strobilanthes flaccidifolius, *Nees*, ACANTHACEÆ. 240

Vern.—*Rúm*, *Rámpát*, ASS.; *Khuma*, *khum*, MANIPUR; *Hom*, PHEKIAL. (Mann in his Assam Forest Administration Report for 1876-77.)

Both **Mann** and **Kurz** speak of a plant yielding a blue dye, the former in Assam and the latter in the Karén country, under the name of **S. flaccidus**. This is probably a mistake for **S. flaccidifolius**, *Nees*.

This exceedingly valuable dye was first made known by **Griffith**, who met with it during one of his Assam explorations. It is pretty generally cultivated by the hill tribes of the eastern frontier, and extends into North-western China. This plant was called **Ruellia indigotica** by **Balfour**, as he explains, in the absence of any better name. It grows freely on the plains of Manipur in a climate not very different from that of many parts of Bengal, Behar or the North-West Provinces, and might be extensively cultivated in Assam. It does not require flooding, which is necessary for the early growth of the Bengal indigo plant, and is therefore not exposed to the danger of having its colour extracted during an exceptionally rainy season. In fact in many respects it possesses properties eminently suited for a profitable indigo crop, and in China at least the dye is pronounced finer than the dye obtained from any other plant. It is propogated freely by cuttings, yields prunings twice or three times a year, and is perennial. It would give little or no anxiety to the planter, and if not sufficiently remunerative to take the place of the Bengal indigo plant, it seems natural to expect that they might with great advantage be cultivated together. The *rúm* would flourish on the higher dry lands in the plantation, yielding its crop probably in the cold and the hot season, while the ordinary indigo might be grown in the low flooded lands and occupy the attention of the planter during the rest of the year. At resent an indigo factory is idle for more than half the year, but with **Sptrobilanthes flaccidifolius** this need not be so.

In Manipur the *khúma* is largely cultivated, and the dye is extracted for home use; nearly every owner of a farm cultivates a small plot of it and prepares his own dye. The twigs, about a foot long, are twice or three times a year plucked and deposited in large earthen pots filled with water. In these primitive vats they are left for the required time, and when ready the decoction of a greenish colour is poured into another pot and violently shaken or stirred by a few twigs. A little lime is generally added, and when the transformation of green into blue indigo has been effected the liquid is poured into a small earthen vessel and boiled down, more and more being added until from the evaporation of the water the vessel is filled with the dye-stuff. A little lime is placed in the mouth of the vessel, which is thereafter placed in the sun to complete the drying of the dye. In this form it is stored for family use or sold in the market.

They use the dye in combination with turmeric to produce shades of green; with lime and turmeric, browns and almost reds; with lime alone, deep blue black; with safflower, purple; and so on as in the ordinary combinations. It was considered necessary to dress certain of my servants in a sort of uniform so as to command respect when travelling amongst the semi-savage hill tribes. I sent to Calcutta for some bright blue cloth and had jackets made of this. My men were very proud of these, and the bright blue was much admired by the Manipur officials. Each man had a pugrie of Manipur cloth dyed by the above process. In a few months the jackets had almost lost their colour; in two years the bright blue cloth of European dye is of a slate colour; but the native pugrie is perfectly unchanged though washed time after time. This is mentioned to justify the recommendation that some effort should be made to have the Assam *Rum* dye experimentally cultivated by our European indigo planters.

Specimens and further information from Assam much required. The necessity for this appeal for specimens may be shewn when it is pointed out that in **Dr. McCann's** *Report on the Dyes of Bengal* the name of this plant is merely mentioned incidentally as taken from **Mr. Gamble's** valuable work on Indian Timbers. No specimens have been received from Assam, although returns are given of much less important dye-stuffs. *Rúm* dye is perhaps one of the best Indian dye-plants, and it has been completely overlooked. **Mr. Liotard**, in his memorandum on *The Dyes of Indian Growth*, disposes of it in a few words by saying that it is grown in Mergui. The home of the plant may be said to be from Assam eastward and north-eastward to China and south-eastward through Manipur and the Naga Hills to Burma and Malay.

STRYCHNOS.

241 **Strychnos Nux-vomica**, *Linn.*, LOGANIACEÆ.

THE SNAKE-WOOD. STRYCHNIN TREE.

Vern.—*Kuchla, kajra,* HIND.; *Kuchila,* BENG.; *Kájra,* MAHR.; *Yetti,* TAM.; *Mushti, musadi,* TEL.; *Kabaung,* BURM.

A moderate sized tree, met with on the mountains of Bengal, Burma and South India, common in the lower forests of Eastern Manipur.

The pulp of the fruit is eaten by birds. The seeds yield Strychnine and Nux-vomica, much used in medicine; also an oil. **Dr. McCann** adds a new and hitherto unknown property of the seeds in his *Report on the Dyes of Bengal*; he says that in Balasore, they give a brown of various shades according to the mordant used. Boiled in water along with lime it gives a pale brown; with proto-sulphate of iron (*hirakosh*), a darker shade.

Additional information from other parts of India, in confirmation of the seeds of this plant giving a dye and being actually used as such, would be interesting.

242 **Sumach,** a tan obtained from the leaves of **Rhus coriaria,** *Linn.*, a native of Europe. This tan is used in the preparation of morocco leather. Many members of the genus are natives of India.

SYMPLOCOS.

Symplocos cratægoides, *Ham.*, STYRACEÆ. 243

Vern.—*Lú-lándar, losh,* PB.; *Lodh,* KUMAUN; *Loja,* SUTLEJ.

A large shrub of the Himalaya, from the Indus to Assam, from 3,000 to 8,000 feet.

The leaves and the bark give a yellow dye.

S. phyllocalyx, *Clarke.* 244

Vern.—*Chandan, Lal-chandan,* HIND., BENG., in **Gamble's** list of Darjiling plants.

The wood of this plant is said to be used by the Paharias in their religious ceremonies and for caste marks. **Gamble** explains that the dye resides more in the root than in the stem. **Dr. Schlich** in the report of Bengal dyes published by the Economic Museum confirms **Mr. Gamble's** observation. **Sir J. D. Hooker,** in his *Himalayan Journal Vol. II.,* 41, describes the women as preparing a yellow dye from the leaves of a **Symplocos** which is exported to Tibet.

The *Flora of British India* identified these two plants as the same as that to which the name of **S. phyllocalyx** has been given.

Specimens of root, as also the leaves, and any additional information, would be most cceptble.

S. racemosa, *Roxb.* 245

Vern.—*Lodh,* HIND., BENG., BOM.; *Chamlani,* NEPAL; *Palyok,* LEPCHA; *Kaiday,* MECHI; *Singyan,* BHUTIA.

A common, small tree from the low hills of Bengal, Orissa and Chutia Nagpur, the Terai, altitude 2,500 feet, to Assam, Burma and China.

A small tree with soft bark, corky and crumbling to powder in the dry state when rubbed. Its chief use is as a mordant, the ashes being used as an alkali (see **Rubia sikkimensis**), or as an auxiliary with other dyes; sometimes it is used as a tan. In the Central Provinces it is regarded as one of the most valued tans

S. spicata, *Roxb.* 246

Vern.—*Lodh, bholia,* HIND.; *Buri,* BENG.

North-East Himalayas and Western Ghâts and Tenasserim.

The leaves are used in dyeing, and the seeds are strung as beads and hung round children's necks, to prevent evil. (*Gamble.*)

The bark of this plant is also used along with indigo to produce different shades of green.

S. theæfolia, *Ham.* 247

Vern.—*Kharani,* NEPAL.; *Chashing,* BHUTIA.

A small, evergreen tree, met with in the Eastern Himalaya, extending to the Khásia Hills and to Martaban.

Dr. McCann gives the vernacular name of *bhauri* to this species, and says that it is used in Dinagepur as an auxiliary in dyeing. **Dr. King** is said to have identified the specimen. The name *bhauri* is, however, very near to *bury,* the Bengali name for **S. spicata,** and it is probable that they both bear the same name; **Dr. McCann,** however, spells them differently.

TABERNÆMONTANA.

248 **Tabernæmontana coronaria,** *Willd.*, APOCYNACEÆ.

Vern.—*Chandni, taggai, taggar,* HIND., BOM.; *Asnru,* NEPAL; *Krim,* LEPCHA.

Small bright shrub with silvery bark and glossy leaves; cultivated in gardens throughout India; native country unknown.

The red pulp obtained from the aril (or extra coat of the seed) gives a red colour, occasionally used as a dye by the hill people.

TAGETES.

249 **Tagetes patula,** *Linn.*, COMPOSITÆ.

THE MARIGOLD.

Vern.—*Genda,* HIND. and BENG.; *Makhmah,* BOM.

A common annual, self-sown and in some parts of India naturalised. Largely cultivated in the gardens of the natives, rich and poor alike; the fœtid flowers are strung in garlands hung round the idols or round the necks of the devotees. A yellow dye is said to be extracted by the poorer classes from the flower and used for home purposes. This gives origin to the shade of yellow known as *gendia.*

TAMARINDUS.

250 **Tamarindus indica,** *Linn.*, LEGUMINOSÆ.

Vern.—*Amli, ambli, imli,* HIND.; *Tentiri, tintúl,* BENG.; *Chincha,* MAR.; *Púli,* TAM.; *Chinta,* TEL.; *Titri,* NEPAL; *Teteli,* ASS.; *Tetúli,* URIYA; *Karangi,* MYSORE; *Magyi,* BURM.

A large, handsome tree, universally cultivated in India.

The flowers and fruit are used as an astringent in dyeing, especially along with safflower. It acts the part of a mordant.

TAMARIX.

251 **Tamarix articulata,** *Vahl.*, TAMARISCINEÆ.

252 **T. dioca,** *Roxb.*

253 **T. gallica,** *Linn.*

Vern.—*Jhau, lei, lái, barí-máín,* HIND., SIND.; *Jhau,* BENG.; *Koan, rúkh, leinyu, ghaslei, pilchi,* PB.; *Yelta,* TIBET; *Samaratul-asl, gas-anjabin,* ARAB.; *Shor-gus.,* PERS.; *Shirushavukku-maram,* TAM.; *shiri-Sarau-marum,* TEL.

It is doubtful if the natives distinguish the above species, hence they have been given collectively. They form gregarious, bushy clumps along our river basins in many desert tracts, such as along the banks of the Suez Canal, constituting almost the entire vegetation. Common throughout India and Burma, ascending to altitude 3,000 feet.

The galls and bark are much used in tanning and as an auxiliary in dyeing.

TAXUS.

Taxus baccata, *Linn.*, CONIFERÆ. 254

THE YEW.

Vern.—*Tcheiray gulab*, NEPAL; *Saráp, badar*, AFG.; *Birmí, barma, túng, thúnu, chatung*, KASHMIR; *Thúner, geli, gallu, lust*, N. W. P.; *Pungchu*, LADAK.

A large tree, met with all along the Himalaya, from the Indus to Bhutan, between 6,000 and 10,000 feet in altitude. Common in the forests of Manipur.

This is a red dye, said to be prepared in the Bhutia parganas.

TECTONA.

Tectona grandis, *Linn.*, VERBENACEÆ. 255

THE TEAK TREE.

Vern.—*Sagun*, HIND., BENG.; *Singuru*, URIYA; *Ság, Sagwan*, MAR.; *Teka*, GOND; *Ság*, BHIL; *Tekku, tek*, TAM.; *Teku*, TEL.; *Jati*, MAL.; *Jádí, téga*, KAN.; *Kyún*, BURM.; *Tekka*, CINGH.; *Sáj*, ARAB.; *Sáj, sal*, PERS.

A large, elegant tree of Central, South India and Burma, cultivated in Assam and Bengal.

The leaves give a red dye.

TEPHROSIA.

Tephrosia tinctoria, *Pers.*, LEGUMINOSÆ. 256

CEYLON INDIGO.

Vern.—*Anil*, CINGH.

An under-shrub of the Western Peninsula and Ceylon, common in Mysore.

The blue dye is sometimes extracted in Mysore.

Samples and further information required.

TERMINALIA.

Terminalia Arjuna, *Beddome*, COMBRETACEÆ. 257

Vern.—*Anjan, arjun, arjuna, kahuá*, HIND.; *Arjuna*, BENG.; *Hanjal*, URIYA; *Arjuna*, MAHR.; *Vella marda, vella matti*, TAM.; *Maddi, billi matti*, MYSORE; *Yermaddi, tella madu*, TEL.; *Taukkyan*, BURM.

A large tree of the Sub-Himalayan tracts of the North-West Provinces and Oudh, extending to Bengal, Burma, Central and South India. The fruit is described as 1 to 2 inches, nearly glabrous, ovoid, or obovoid-oblong, the wings not very broad, their striations curving much upwards. (*Hooker's Fl. Br. Ind.*)

The bark is a tonic and astringent, used sometimes in dyeing and tanning like most other members of this genus, but it seems to serve as a concentrator of colour rather than as a dye material. It is, however, said to give a black dye with babul (**Acacia arabica**). The fruit is not mentioned as being used as a myrabolan, and is probably inferior to the others.

TERMINALIA.

Specimens of the fruit and bark of this plant, as indeed of all the following species of Terminalia, would facilitate the identification of the mass of interesting material in the possession of the Bengal Economic Museum. Great confusion exists amongst these specimens, and it would be important to have accurately-named specimens of all the myrabolans and of the barks of the trees from which they are obtained. Specimens not identified should, if possible, be accompanied with a leafy, or, still better, a flowering, twig, dried between blotting paper.

258 **Terminalia belerica,** *Roxb.*

Vern.—*Bhaira, bahera,* HIND.; *Bohera,* BENG., *Thara,* URIYA; *Bherda,* MAR.; *Babra, balda,* DEC.; *Babela,* PERS.; *Kanom,* LEPCHA; *Chirorœ,* GARO; *Hulluch,* ASS.; *Beheda, yella,* MAHR.; *Tani, kattu, elupay,* TAM.; *Tani, tandi,* TEL.; *Thitsein,* BURM.; *Bulu,* CINGH.

A deciduous tree, attaining a height of 60 to 80 feet, common in the plains and lower hills throughout India (except in the desert regions of West India).

The fruit is described as ½ to ¾ inch in diameter, globular, suddenly narrowed into a short stalk, smooth, covered by a close, fulvous *tomentum,* when dried obscurely 5-angled (*Hooker, Fl. Br. Ind.*)

The fruit is one of those exported from India under the name of Myrabolans, and is largely used in dyeing and tanning; native ink is also made from it. The leaves and the fruits together are often used in tanning.

259 **T. Catappa,** *Linn.*

Vern.—*Badam,* BENG., BOM.; *Taree,* KAN.; *Natvadom,* TAM.; *Vedam,* TEL.; *Catappa,* MALAY.

A large and exceedingly handsome tree, with leaves assuming an autumnal tint in the cold season and falling off in the beginning of the hot season. Wild in the Malay, and perhaps also in the Andaman, Islands Widely cultivated throughout the tropical parts of India.

The fruit is described as 1 to 1½ inch ellipsoid, slightly compressed so as to show two ridges. (*Hooker's Fl. Br. Ind.*)

The bark and the leaves give a black dye.

260 **T. Chebula,** *Retz.*

Vern.—*Harra, har, harara,* HIND.; *Hilikha,* ASS.; *Haritaki,* BENG.; *Silim,* LEPCHA; *Halra, harla,* DEC.; *Karka, harro,* GOND.; *Hiradá,* MAHR.; *Kadakai,* TAM.; *Karaka,* TEL.; *Panga,* BURM.; *Alu,* CINGH.

A large tree, attaining the height of 80 to 100 feet, abundant in North India from Kumaun to Bengal, and southward to the Deccan table-lands; also in Ceylon, Burma and the Malayan Peninsula.

The fruit is described as ¾ to 1¼ inch, ellipsoidal or obovoid from a broad base, glabrous, more or less, 5-ribbed when dry (*Hooker, Fl. Br. Ind.*)

The bark is used for tanning and dyeing, and the fruit gives the black Myrabolans reported to be of better quality than the Myrabolans from **T. belerica.** They are exceedingly valuable, the produce of a single tree being worth about Rs. 2,000. The fruit consists of a central solid mass, from which the valuable rind is separated and pounded. After mixing it with water and allowing it to soak for a time, the solution is ready. The cloth is steeped once or twice and dried, and then placed in the dye solution. With iron salts it gives a black dye; with turmeric and indigo, a green; and with catechu, a brown. In all these instances the *harra* is a concentrator or vegetable mordant to the actual colours. The young twigs are often covered with galls, used in dyeing and tanning, and in the preparation of ink along with iron. With alum, the fruits give a yellow dye.

Specimens of the galls and of the bark very much needed.

Terminalia citrina, *Roxb.* 261

Vern.—*Haritaki,* BENG.; *Hilika, silikka,* ASS.; *Hortaki,* CACHAR; *Kyu,* BURM.

A large, deciduous plant, met with in Eastern Bengal, Assam, Cachar, Burma, and the Andaman Islands.

Gamble says it is used as a "dye-plant"; but most probably only as an auxiliary in place of **T. Chebula,** which it very much resembles, differing in straight stem, brighter foliage and narrower fruits. The fruit is described in the *Flora of British India* as nearly 2 inches long, oblong, lanceolate; while fresh, obscurely angled. Compare with **T. Chebula.**

T. paniculata, *W. & A.* 262

Vern.—*Pe-karakai,* TAM.; *Nimiri,* TEL.; *Kinjal, kindal,* MAR.

A large tree in the forests of the West Coast of India, from Bombay southward.

The fruit is described as brown-red, villous, with one very broad and two narrow wings. (*Hooker's Fl. Br. Indica.*)

The bark is reported to be used in dyeing and tanning; neither fruit nor bark is at present in our collection.

T. tomentosa, *W. & A.* 263

Syn.—PANTAPTERA TOMENTOSA, *Roxb.* (*Fl. Ind. Ed. C. B. C. 383.*)

Vern.—*Saj, sein, asan, assaim, asna, sadri,* HIND.; *Piasal, usan,* BENG.; *Saháju,* URIYA; *Amari,* ASS.; *Taksor,* LEPCHA; *Kara marda, anemui,* TAM.; *Maddi, nella-madu,* TEL.; *Karkaya, sadora,* HYDERABAD; *Ain, madat,* MAR.; *Taukkyan,* BURM.; *Kúmbúk,* CINGH.

A large tree of the Sub-Himalaya from the Ravi eastward, ascending to altitude 4,000 feet; Bengal, Central and South India and Burma.

The fruit is described as 1 to 2 inches, glabrous or hoary, obovoid-oblong, wings broad, striations carried horizontally to the edge. (*Hooker's Fl. Br. India.*)

The bark is used for tanning and dyeing black, and the ashes yield lime, eaten by the natives in *pán.* (*Gamble.*) The bark is largely used as a tan; it imparts the characteristic red colour to native leather, and cut up in small pieces and boiled for 6 or 8 hours, it gives a brown dye; along with the bark of **Mimusops Elengi** it is used to produce a red dye in jute. It gives a black dye with iron.

THESPESIA.

Thespesia populnea, *Corr.,* MALVACEÆ. 264

THE TULIP OF PORTIA TREE.

Vern.—*Parsipu,* HIND.; *Poresh, parash, paresh-pipal,* BENG.; *Bhendi,* MAHR.; *Poris, portia, pursa,* TAM.; *Gangaraya,* TEL.; *Bendi,* GUZ.; *Sureya,* CINGH.

An exceedingly handsome tree, largely cultivated along roadsides, especially in Madras City. Indigenous to the coast forests of India, Burma and the Andaman Islands.

The capsules, as also the flowers, are said to give a yellow dye, which is apparently little used.

TODDALIA.

265 **Toddalia aculeata,** *Pers.*, RUTACEÆ.

Vern.—*Kanj,* HIND.; *Dahan, lahan,* RAJ.; *Meinkara,* NEPAL; *Saphijirik,* LEPCHA; *Milkaranai,* TAM.; *Konda kashinda,* TEL.; *Kyan-sa,* BURM.

A large, scandent shrub, covered with prickles, met with on the Himalaya from Kumaun eastward to the Khâsia hills, ascending to altitude 5,000 to 6,000 feet; also common throughout the Western Peninsula and Ceylon.

The whole plant is aromatic or hot and pungent, and used by the natives as a bitter or aromatic tonic. Dr. Bidie reports that the root-bark is used in Madras as a yellow dye-stuff. This is by some supposed to be the Lopez Root of Europe. (*Liotard's Memo. on Dyes.*)

Specimens required, as also information as to the mode of use, and specimen of cloth dyed.

TRIGONELLA.

266 **Trigonella Fœnum-grœcum,** *Linn.*, LEGUMINOSÆ.

Vern.—*Methi,* HIND., BENG.; *Vendayam,* TAM.; *Mentulu,* TEL.

A small, herbaceous plant, cultivated chiefly as a food crop in many parts of India. The seeds are largely used as a condiment and as a substitute for coffee. They also yield a yellow dye.

UNCARIA.

267 **Uncaria Gambier,** *Hunter,* RUBIACEÆ.

THE GAMBIER, PALE CATECHU or TERRA JAPONICA.

Vern.—*Kath, kutha,* HIND.; *Ankudu-karra,* TEL.; *Gambir,* MAL.

An extensive, scandent bush, native of Ceylon and the Malay Archipelago, distributed to Java and Sumatra.

The extract is obtained by boiling the leaves and young shoots. It is much valued in tanning, giving a softness to leather, obtained from almost no other substance.

It is largely cultivated at Singapore; in 1829 there were 800 plantations. These declined from want of fuel and dearness of labour. They have to a certain extent revived. It seems likely that this would prove an interesting plant for cultivation in India.

VENTILAGO.

268 **Ventilago madraspatana,** *Gaertn.*, RHAMNEÆ.

Vern.—*Raktapitta,* BENG.; *Papli,* TAM.; *Yerra-chicatli,* TEL.; *Lokandi,* BOM.; *Chorgu,* HYDERABAD.

An extensive climber, with green, offensive flowers, met with in the forests of Central and South India.

The root-bark yields a red-dye (*Gamble*), orange and chocolate with **Oldenlandia umbellata,** and black with galls (*Spons' Encyclop*).

Specimens and additional information much required. This is the *pupli* bark of Nellore.

Verdigris. 269

Sub-Acetate of Copper.

Vern.—*Zangar.*

Produced as a rust upon copper by bringing the metal into contact with acetic acid. Sometimes used in calico-printing.

Vitex Negundo, *Linn.*, Verbenaceæ. 270

Vern.—*Samaloo, pani-ká-samaloo,* Hind.; *Nishinda,* Beng.; *Sindooka,* Sans.; *Fenjenghist,* Arab.; *Shambalee,* Dec.

A native of Cochin-China, Ceylon and South India. Common in Sind, the Punjab Siwalik tract, to 3,500 feet in the outer hills, and occasionally in the Salt Range; also in Bengal and the Western Presidency.

The ashes of this plant are largely used as an *alkali* in dyeing.

Vitriol. 271

Blue Vitriol. Sulphate of Copper.

Vern.—*Tutia.*

This substance is used chiefly in leather-dyeing, along with lime, to produce a light blue.

Green Vitriol. Sulphate of Iron or Copperas.

Vern.—

White Vitriol. Sulphate of Zinc.

Red Vitriol. Sulphate of Peroxide of Iron and Magnesia.

Oil of Vitriol. Sulphuric Acid.

Wagatea spicata, *Dalz.*, Leguminosæ. 272

Vern.—

A climber of the Western Ghâts.

Wattle Bark. 273

The bark of various species of Australian Acacia, used for tanning, chiefly **A. decurrens,** *Willd.*, now being experimentally cultivated in several districts of India, chiefly on the Nilgiris.

The "Golden" or "Broad leaf" Wattle is perhaps the most valuable species for tanners' bark and gum. **A. melanoxylon** and **A. dealbata** are also used. (*Gamble.*) **A. floribunda, A. affinis,** and others are amongst those now so largely exported to Europe as Tanners' Wattle, that vast tracts of Acacia forest are fast disappearing in Australia. (*Smith.*)

WEDELIA.

Wedelia calendulacea, *Less*, Compositæ. 274

Vern.—*Bhánrá,* Hind.; *Bangra, kesaraja,* Beng.; *Pita-bhringi, bringaraja,* Sans.; *Pivala-maka, pivala-bangra, pivalá-yellow,* Mahr.

The leaves of this plant are said by **U. C. Dutt,** in his *Materia Medica, p. 181,* to be used in dyeing grey hair and to promote the growth of hair. **Dr. McCann,** in his *Report on the Dyes and Tans of Bengal,* says that in Lohardagga the root is pounded and gives a black dye with salts of iron.

Specimens of this root, as also the dye-stuff or cloth dyed with it, would be interesting.

WENDLANDIA.

275 **Wendlandia tinctoria,** *DC.*, RUBIACEÆ.

Vern.—*Túla-lodh,* BENG.; *Kangi,* NEPAL; *Singnok,* LEPCHA; *Telli,* URIYA; *Tamayoke,* BURM.

A small, elegant tree, with large crowded panicles of white, sweet-scented, small flowers, terminating the boughs. Common in the forests in Kumaun, Oudh, Behar, Bengal and Burma.

I have never heard of this plant being used as a dye-stuff, which the name **tinctoria** implies, but the bark is largely used as a mordant in dyeing, especially by the hill tribes of Eastern Bengal, Assam, and the Naga Hills.

WOODFORDIA.

276 **Woodfordia floribunda,** *Salisb.*, LYTHRACEÆ.

Syn. - GRISLEA TOMENTOSA, *Roxb.*

Vern.—*Dáwi, dha, thawi, sautha, dhaula,* HIND.; *Dhewti,* OUDH; *Jatiko,* URIYA; *Phulsatti,* MAR.; *Dhuvi, surtari,* C. P.; *Pitta,* GOND; *Dahiri,* NEPAL.; *Dhayati,* MAHR.; *Dháuri,* BOM.; *Jargi,* TEL.

A small, much-branched bush, when in flower becoming simply purple, from its having numerous flowers all along the branches. Common throughout India, ascending on the Himalaya to altitude 5,000 feet.

The flowers give a red dye used in silk dyeing but not frequently. Alum or lime is used as a mordant. It is more often used along with **Morinda.** The leaves are said to be sometimes used as a tan along with the flowers which impart their colour to the skin.

The leaves of this plant, along with the bark of **Zizyphus xylopyra,** forms the tanning mixture of Bundelcand, taking the place of *babul,* (or Indian Wattle), so frequently used in most parts of India. (*Buck, Dyes and Tans of North-Western Provinces.*)

WRIGHTIA.

277 **Wrightia tinctoria,** *R. Br.*, APOCYNACEÆ.

Vern.—*Bhur-kuri,* BOM.; *Dudhi,* BANDA; *Khirni,* MEYWAR; *Pala,* TAM.; *Kalakuda,* MAHR.; *Chite-ancallo, tedlapal,* or *ankudu,* TEL.; *Kala kudu,* MARH. and HIND.; *Haya marak,* SANS.

A small tree, common in the Peninsula, ascending to 4,000 feet in altitude.

The seeds are said to be used as an adjunct in dyeing, and the leaves yield an indigo used along with the seeds of **Cassia Tora.** Said to be prepared in South India.

Samples of leaves, seed, and indigo much required.

278 **W. tomentosa,** *Roem and Scheult.*

Vern.—*Keor, kilawa,* PB.; *Dudhi, dharauli, daira,* HIND.; *Karingi,* NEPAL; *Selemnyok,* LEPCHA.; *Pal kurwan,* URIYA; *Tella pal, koilamukri,* TEL.; *Atkuri,* ASS.; *Lettóp-thein,* BURM.

A small, deciduous tree of the Sub-Himalayas from the Bias eastward to Oudh, Bengal, Burma, Central and South India.

A yellow juice flows from this plant, which mixed with water forms a good yellow dye. Some clothes that had been dyed with it had preserved this color for two years as bright and as fresh as at first.

ZIZYPHUS.

Zizyphus Jujuba, *Lamk.*, RHAMNEÆ. 279

Vern.—*Kúl, ber,* HIND., BENG.; *Bhor,* MAR.; *Elandap-pasham, yallande,* TAM.; *Rengha, rengi,* TEL.; *Zi,* BURM.

A small, thorny tree common throughout India and Burma.

Dr. Brandis says "the *bark* is used as a dye-stuff"; and Atkinson in his *Himalayan Districts, p. 779,* says, "this tree yields a much-valued tanning material in its bark." It does not appear to be used in Bengal as a tan.

Z. xylopyra, *Willd.* 280

Vern.—*Katber, beri, goti, chittania, ghont,* HIND.; *Goti,* TEL.; *Bhorgoti,* MAR.

A large, scrambling shrub, found in the Sub-Himalayan tract and in Central and South India.

The bark is used for tanning; it imparts a black colour.

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PART III.

FIBRES AND FIBRE-YIELDING PLANTS.

ECONOMIC PRODUCTS OF INDIA

EXHIBITED AT THE

Calcutta International Exhibition, 1883-84.

PART III.—Fibres and Fibre-yielding Plants.

ABROMA.

Abroma augusta, *Linn.*, STERCULIACEÆ. 1

Vern.—*Ulatkambal,* BENG.

A small bush, widely spread, native or cultivated, throughout the hotter parts of India.

The root-bark is an emmenagogue, and the bark of the twigs yields a much-valued fabric, which deserves to be more generally known. It might be used with advantage as a substitute for silk. The plant yields three crops a year.

ABUTILON.

Abutilon asiaticum, *G. Don,* and **A. indicum,** *G. Don,* MALVACEÆ, are two species so nearly allied botanically, that from an economic point of view they may be regarded as one and the same. 2

COUNTRY MALLOW.

Syn.—SIDA ASIATICA, *Willd*; S. POPULIFOLIA, *Willd*; S INDICA, *Willd, as in Roxb.*, belong to the latter species.

Vern.—*Hungai, kangai* or *kanghi, jhampi,* HIND.; *Petári,* BENG.; *Kangoi, chakra-bhenda,* DEC.; *Petari,* MAHR.; *Tutti* (or *tuthi nar*), *perun-tutti,* TAM.; *Tuttura- benda, nugu-benda, chettu,* TEL.

A. asiaticum (*G. Don*) is chiefly met with in Western India and Ceylon, while **A. indicum** (*G. Don*) is widely distributed throughout tropical India, to Prome, Pegu and Ava (wanting in Malacca). They are annual or perennial bushes, frequenting roadsides, banks of rivers, &c., especially in the vicinity of villages. Their curious fruit, consisting of a whorl of carpels, has apparently suggested many of the designs in jewellery made in Eastern India. They blossom and seed all the year, and when not insect-eaten, their graceful velvety leaves contrast elegantly with their yellow flowers.

The stems contain a good fibre, suitable for cordage. (See remarks under **A. Avicennæ.**) These exceedingly abundant wild plants deserve attention as paper-yielding fibres.

3 **Abutilon Avicennæ,** *Gaertn.*

INDIAN MALLOW; AMERICAN JUTE.

References.—*Hook. Fl. Br. Ind. 3 i. 327; Roxb. Fl. Ind. Ed. C. B. C. 518; Christy New Comm. Pl., 33-34.*

Syn.—SIDA ABUTILON, *Willd., in Roxb. Fl.*

A native of North-West India, Sind, Kashmir, and distributed to North Asia and westward to South Europe and North America. It is said to be also met with in Bengal, but **Roxburgh** first reared it from seeds received from China under the name of *King-ma.* In Bengal it would therefore seem to be introduced or met with in cultivation only.

Considerable attention has of late years been directed to the fibre produced from this species; in the United States vast quantities are being prepared over the region from Ohio to Mussouri. "It is pronounced superior to Indian jute and finer than Manilla hemp. It takes readily any colour, and its natural lustre displays more in the aniline dye than in any other—a great advantage over Indian jute, which is antagonistic to cheap bleaching and dyeing." "It is stated that an acre of ground will produce 5 tons of **Abutilon** stalks, and about 20 per cent. of pure fibre is obtained after preparation. Considered superior to jute fibre as imported, the long fibre is fully equal in value to Calcutta prime jute, and Philadelphia rope-manufacturers have already offered to buy any quantity at the highest market price for jute" (*Christy*). This is exceedingly important, and points to the advisability of a thorough examination of this and other Indian species with special reference to their fibres. It is recommended to be sown broadcast, the yield from good soil being 4 tons an acre of dry stalks.

4 **A. graveolens,** *W. & A.*

Vern.—*Bura-kungi,* HIND. and BENG.

The stems yield a fibre.

5 **A. muticum,** *G. Don.*

Syn.—SIDA TOMENTOSA, *Roxb.*

An erect annual, native of rubbish, road-sides, hedges, &c., where the soil is good; met with in the North-West Provinces an Western Peninsula. Yields a fibre.

6 **A. polyandrum,** *Schlect.*

Syn.—SIDA POLYANDRA, *Robx.*

Vern.—*Velai-thuthi,* TAM.?

A native of the North-West Provinces, tropical Himalayas up to altitude 3,000 to 4,000 feet, Western Peninsula, Nilgiris and Ceylon.

It yields a long, silky fibre resembling hemp.

ACACIA.

7 **Acacia arabica,** *Willd.,* LEGUMINOSÆ.

Vern.—*Babul, kikar,* HIND.; *Karijali mara,* KAN.

A small, thorny tree common everywhere.

The bark of the slender twigs yields a fibre, which is used in the Punjab for the manufacture of paper.

Acacia latronum, *Willd.* 8

Vern.—*Bhes,* HIND.; *Paki-tuma,* TEL.

A thorny shrub found in South India.

It is said to yield a good fibre.

A. leucophlœa, *Willd.* 9

Vern.—*Kikar,* HIND.; *Vel-velum,* TAM.

A tree met with in North, West and South India, also in North-West Provinces and Rajputana.

A coarse, tough fibre is prepared from the bark.

Adam's needle. *See* **Yucca gloriosa.** [294]

ADANSONIA.

Adansonia digitata, *Linn.,* MALVACEÆ. 10

THE BAOBAB TREE or the MONKEY BREAD TREE OF AFRICA.

Vern.—*Hathi-khatyan,* DEC.; *Anai-puliya-roy,* TAM.; *Hujed,* ARAB.

Cultivated in some parts of India to a small extent; deserves to be extended.

The bark yields a strong, useful fibre, which seems likely to be useful in paper manufacture.

ÆSCHYNOMENE.

Æschynomene aspera, *Linn.,* LEGUMINOSÆ. 11

Vern.—*Sola,* BENG.; *Atunete,* TAM.; *Paukpan, paukbyu,* BURM.

Bengal, Assam, Burma, and South India.

A small, sub-floating bush, frequenting marshes, growing most during the season of inundation.

In Burma a fibre is obtained from the outer bark around the pith. The chief economic use of the plant is, however, for its pith, which is largely used by fishermen for floats; it is cleverly cut up into paper-like sheets and made into the temporary decorations around the idols during certain festivities. Europeans use it for making hats which, while being perfect protectors from the sun, are extremely light.

AGAVE.

Agave americana, *Linn.,* AMARYLLIDEÆ. 12

AMERICAN ALOE; VEGETABLE SILK.

Vern.—*Thalhi-sengar, bará-kanvar, jungli-kanvar,* HIND.; *Pita, baknas-puttah, jungli-ánáras, bilati-pat,* BENG.; *Jangali-ananas, párkánda,* BOM.; *Anaik-katrashai,* TAM.

Originally a native of America; now wild in many parts of India.

The leaves and the root yield an excellent fibre, certain to become an important paper material. The plant is now largely cultivated along railway enclosures, and would prove a source of revenue if extended to fill all such enclosures, protecting the railway from animals, and much less dangerous than trees. Ropes are made of the fibre by the Koli fishermen of Bombay which are used in their boats and for other purposes.

In experiments performed at the Bally Paper Mills it was discovered that one of the greatest difficulties in the way of Agave fibre for paper manufacture was the fact that the young leaves yielded too fine a pulp for paper. That the best leaves were those three years old. A mixture was proved to be injurious, and therefore a difficulty exists in the necessity of getting uniformly leaves of the same age, and if possible leaves three years old.

13 **Agave Sisala.**

The Sisal Hemp of Mexico; a valuable American form, apparently not yet introduced into India.

14 **A. vivipara,** *L.*

THE BASTARD ALOE.

Syn.—AGAVE CANTALA, *Roxb.*

Vern.—*Kathalai,* TAM.; *Petha-kalabantha,* TEL.; *Kantala,* SANS.

Some authors seem to think this should not be regarded as a variety of **A. americana** but rather as a distinct species, differing, as it does, chiefly in the fact that it raises its cluster of leaves upon a short erect stem upon which viviparous buds are produced. It is altogether a much less robust plant. The leaves are less fleshy and erect instead of reflexed. The flowering stem is less than half the height of that of **A. americana**, and much thinner and red-coloured.

ALNUS.

15 **Alnus nitida,** *Endl.*, BETULACEÆ.

Vern.—*Shaol, saroli, sawáli, raján,* PB.; *Paya, udesh,* KUMAUN; *Gira,* AFG.

A large tree of the Punjab Himálaya, ascending to altitude 9,000 feet.

The young twigs are used for tying loads, rope-bridges, and for the construction of baskets.

ALOE.

16 **Aloe vera,** *Linn.*, LILIACEÆ.

Syn.—A. BARBADENSIS, *Miller*; A. PERFOLIATA, *var.*, *Ait.*; A. ELONGATA, *Murray*; A. INDICA, *Royle*; A. LITTORALIS, *Koenig.*

Vern.—*Ghi-komar,* HIND.; *Ghrita-kumari,* BENG.; *Kattale, kala-buntha,* TAM.; *Mok,* BURM.

Many varieties of this plant are met with in cultivation throughout India. It has gone wild in some localities in the extreme south.

The leaves yield a good fibre.

ANADENDRUM.

17 **Anadendrnm panicalatum,** AROIDEÆ.

Vern.—*Yolba,* AND.

In the Andaman Islands, the bow strings are made from the fibre of the bark of this plant, to which, to increase strength, a coating of black bee's wax (*Tobul-pid*) is frequently applied. Nettled reticules are also prepared from this fibre, which are used by women for carrying small objects. (*Mr. Mann's Andaman Nicobar Islands Catalogue.*)

ANANASSA.

Ananassa sativa, *Linn.*, BROMELIACEÆ. 18

Vern.—*Anáras,* BENG.; *Ananas,* HIND.; *Nanat,* BURM.

This and all the other members of the same order now met with in India are believed to have been introduced from America. From the name one would suppose it had reached India through Persia.

The leaves, which require to be steeped in water for 18 days, yield a beautiful fibre, which, but for the difficulty of extraction, would be largely used. This fibre is in request for threading necklaces, as it does not rot, and is very strong.

Anatherum muricatum, *Beauv. See* **Andropogon muricatus,** *Retz.* [20]

ANDROPOGON.

Andropogon laniger, *Desf.*, GRAMINEÆ. 19

THE JUNCUS ODORATUS.

Syn.—A. IWARANCUSA, *Roxb.* (*in part*); CYMBOPOGON LANIGER, *Ders.*

Vern.—*Lámjak, khávi, panni, solára, san,* HIND.; *Miriya, ban, ganguli, bad, piriya,* N. W. P.; *Káránkusá,* BENG.; *Lámajjak,* SANS.

A native of the lower slopes of the Himalaya.

A. muricatus, *Retz.* 20

Syn.—ANATHERUM MURICATUM, *Beauv.*

Vern.—*Khas,* HIND.; *Khas-khas,* BENG.; *Vette-ver,* TAM.; *Usir,* SANS.

A grass abundant on sandy banks in Bengal, Upper India, the Coromandel Coast, and Mysore, where it is commonly planted to divide fields.

The roots are made into aromatic scented mats hung over doors and kept wet to cool the atmosphere in the hot season, and are also in great demand for making fans, &c. The grass is suited for the manufacture of paper, and it is estimated that from 60,000 to 70,000 maunds are annually available in the Hissar District of the Punjab.

A. Schœnanthus, *Linn.* 21

THE GERANIUM GRASS.

Syn.—A. MARTINI, *Roxb.*; A. NAEDOIDES, *Nees*; A. CALAMUS-AROMATICUS, *Royle*; A. PACHNODES, *Trin.*; CYMBOPOGON MARTINI, *Munro.*

Vern.—*Rusa ghas, agia ghás, bhor, musel, mirchia gand,* HIND.

This grass grows wild in Central India, the North-West Provinces, and the Punjab.

Originally a native of Balaghat, from which General Martin sent the seeds to the late Dr. Roxburgh. They were gathered during the last war with Tippu Sultan. This is the Roussa Paper grass, abundant everywhere in the Deccan.

ANONA.

22 **Anona reticulata,** *Linn.*, ANONACEÆ.

BULLOCK'S HEART.

Vern.—*Nona*, BENG.; *Rawsita*, TAM.

A small tree, common everywhere; wild apparently in some districts, but chiefly met with in cultivation.

A good fibre is prepared from the bark of the young twigs.

23 **A. squamosa,** *Linn.*

CUSTARD APPLE.

Vern.—*Sapripha*, HIND.; *Ata*, BENG.; *Awza*, BURM.

A small tree, the Sweet-sop of the West Indies, naturalised in Bengal and the North-West Provinces.

An inferior quality of fibre may be prepared from this species.

ANTHISTIRIA.

24 **Anthistiria arundinacæ,** *Roxb.*, GRAMINEÆ.

Vern.—*Ulu, ullah, kangar, khandura*, N. W. P.

A grass met with chiefly in the North-West Provinces.

The culms yield a fibre used for cordage, and for the sacrificial strings used by the Hindus where the **Saccharum munja** is not available. The leaves are also used for thatching.

This name has been retained for the present, for until the grasses of India have been worked up, and their synonymy established, it is useless to depart from the names given by authors on Economic Botany. It seems likely, however, that this may be brought under **Imperutra arundinacea.** (*Carll.*)

ANTIARIS.

25 **Antiaris toxicaria,** *Leesch.*, URTICACEÆ.

TRAVANCORE SACKING TREE; THE UPAS TREE.

Syn.—A. SACCIDORA, *Dalz.*

Vern.—*Jásund, rúkhá, chándala, chándakudá*, BOM.; *Alli, natavil*, TAM.; *Hmyasaeit*, BURM.

A gigantic tree of the evergreen forests of Burma, Western Ghâts, and Ceylon.

The natives strip the bark of this tree into large pieces, soak them in water, and beat them well, when a good white fibre is obtained—a natural cloth which they use as clothing. There seems every likelihood that the bark of this tree may come into use as a paper fibre.

ARECA.

26 **Areca Catechu,** *Linn.*, PALMÆ.

THE BETEL-NUT PALM.

Vern.—*Gua, supari*, BENG.; *Gubak*, SANS.; *Kottaipakka*, TAM.; *Kun*, BURM.

One of the most elegant of Indian palms, with a thin straight stem and crown of leaves like arrows stuck in the ground. The spathe which covers the flowering axis may be used for paper-making.

ARENGA.

Arenga saccharifera, *Labill.*, PALMÆ. 27

Syn.—SAGUERUS RUMPHII, *Roxb., Fl. Ind., III,* 626.

Vern.—*Taung-oug,* BURM.

A Malayan tree generally cultivated in India, but said by Kurz to be wild in Burma.

At the base of the petiole is found a beautiful black horse-hair-like fibre known as the Gomuta Fibre.

ARTOCARPUS.

Artocarpus integrifolia, *Linn.*, URTICACEÆ. 28

Vern.—*Panas,* HIND.; *Kanthal,* BENG.; *Panasa,* SANS.; *Phanasa,* MAHR.; *Palah,* TAM.; *Peinne,* BURM.

A large tree with a dense dome of deep dark foliage, having immense fruits clustered around the stem—one of the most characteristic associations of the Indian rural village.

The bark yields a fibre.

A. Lakoocha, *Roxb.* 29

Vern.—*Dephal,* BENG.; *Lakucha,* SANS.

A common tree throughout India and Burma.

A fibre is prepared from the bark; used for cordage.

ARUNDINARIA.

Arundinaria falcata, *Nees,* GRAMINEÆ. 30

HIMALAYAN BAMBOO.

Vern.—*Nirgal, nigal,* HIND.; *Sprag,* KUNAWAR; *Prong,* N. W. P.; *Prongnok,* LEPCHA.

Met with from the Ravi to Bhutan above 4,500 feet in altitude. (*Gamble.*)

The leaves are used for roofing and baskets.

A. Hookeriana, *Munro.* 31

Vern.—*Praong, prong,* LEPCHA; *Singhani,* NEPAL.

A bamboo, with stems 12 to 15 feet in height, common about Dumsong. Found in Sikkim at 4,000 to 7,000 feet in altitude. (*Gamble.*)

The seeds are edible.

A. racemosa, *Munro.* 32

Vern.—*Pummoon,* LEPCHA; *Pat-hioo,* NEPAL.

A bamboo, 2 to 4 feet high, with bluish rough internodes, occurring in Sikkim and Nepal above 6,000 feet. (*Gamble.*)

It is extensively used for making mats.

ARUNDO.

Arundo Karka, *Roxb.*, GRAMINEÆ. 33

Vern.—*Karka, nal,* BENG.; *Nuda-nar,* HIND.; *Bag, narre,* PB.

The plant grows chiefly on the lower hills and outer slopes of the Himalayas; but one species is met with in ditches and wet places in Bengal.

This grass, with one or two allied species, such as **A. Roxburghii,** *Kunth,* and **A. nepalensis,** is brought down to the plains of India under the generic vernacular name of *Nal,* and are made into *durma* mats, and cane-work for chairs. The fibre of the flower stalk is made into ropes.

BAMBUSA.

34 **Bambusa arundinacea,** *Retz.*, GRAMINEÆ.

BAMBOO.

Vern.—*Kattang,* HIND.; *Bans,* BENG.; *Mandgay,* BOM.; *Mangil,* TAM.; *Kyakatwa,* BURM.

The common bamboo of Central and South India and Burma. (*Gamble.*)

35 **B. Balcooa,** *Roxb.*

Vern.—*Balku,* BENG.; *Betwa,* CACHAR; *Bara baluka,* ASS.

A bamboo, with stems often 50 to 70 feet in height. This is the best Bengal species for building and scaffolding. (*Gamble.*)

36 **B. Brandisii,** *Munro.*

Vern.—*Ora,* BENG.; *Kyalowa, wabo,* BURM.

A bamboo met with in Chittagong and Burma. (*Gamble.*)

37 **B. nutans,** *Wall.*

Vern.—*Mahlbans,* NEPAL; *Mahlu,* LEPCHA; *Pichle,* SYLHET.

A most beautiful species, largely planted near villages in Sikkim and Bhutan. (*Gamble.*)

38 **B. Tulda,** *Roxb.*

Vern.—*Peka,* HIND.; *Tulda, jowa, matela,* BENG.; *Thaikwa,* BURM.

The common bamboo of Bengal.

The wood is strong, and the halms are used for roofing, scaffolding, mats, and other purposes. (*Gamble.*)

BAUHINIA.

39 **Bauhinia anguina,** *Roxb.*, LEGUMINOSÆ.

THE SNAKE-CLIMBER.

Vern.—*Nag-pút,* SILHET; *Naiwilli,* NEPAL.

A curious conduplicately bent climber of North and East Bengal, Chittagong, Martaban and South India.

Its bark is used in rope-making.

40 **B. macrostachya,** *Wall.*

Vern.—*Gunda-gilla,* BENG.

An extensive climber, running over the trees in the forests of Sylhet and Assam.

The bark yields a strong fibre.

Bauhinia purpurea, *Linn.* 41

Vern.—*Kaliar,* HIND.; *Rakta kanchan,* BENG.; *Pedda-are,* TAM.; *Mahah-legani,* BURM.

An ornamental tree, 20 to 30 feet in height, met with chiefly in Bengal, Burma, North-West Provinces, and South India.

A fibre may be prepared from the bark.

B. racemosa, *Lam.* 42

Vern.—*Marvil, ghila, gúriál, asta, ashta, kachnál,* HIND.; *Banraji,* BENG.; *Vanarája,* SANS.; *Apta,* MAHR.; *Ari, aro,* TEL.; *Palan,* BURM.

A small tree found all over India.

A strong fibre is made from the inner bark; used for cordage, but not durable in water. It yields a good bast and slow match.

May this not be the undetermined bast fibre described by **Royle** under the name of *Asta, Patu,* sent from Birbhúm to the Exhibition of 1851?

B. tomentosa, *Linn.* 43

Vern.—*Kachnar,* HIND.; *Kanchini,* TAM.

A shrub or small tree of South India.

From the bark a fibre is prepared.

B. Vahlii, *W. & A.* 44

Vern.—*Maljan, malu, jallaur,* HIND.; *Chehur,* BENG.; *Chambuli,* MAHR.; *Adda,* TAM.; *Sihar, maul,* C. P.

This is one of the most extensive, as it is the most abundant and most useful, of Indian climbers. It is found all along the Lower Himalayas from the Chenab eastward, in North and Central India, and Tenasserim.

Its uses are, perhaps, more numerous than those of any other forest plant; the strong cordage prepared from its bark is not the least important.

This is said to be the undetermined bast fibre which **Royle** describes as having been sent to the Exhibition of 1851 from the district of Birbhúm.

In the Kew Report for 1881, it is stated that the leaves of this plant and not those of **Cochlospermum gossypium** are used in the construction of the crude leaf-bellows in Sikkim.

BEAUMONTIA.

Beaumontia grandiflora, *Wall.,* APOCYNACEÆ. 45

Vern.—*Barbari,* NEPAL.

Is a large climber of East and North Bengal, with large showy lemon-white flowers. It is found from Nepal eastward to Sikkim, Sylhet, and Chittagong.

A fibre is prepared from the young twigs.

BERRYA.

Berrya Ammonilla, *Roxb.,* TILIACEÆ. 46

Vern.—*Petwun,* BURM.

Kurz says this plant is not unfrequent in the drier, upper, mixed forests of Martaban and Pegu, 3,000 feet in altitude.

In the *Amsterdam Catalogue* a fibre from this tree is mentioned as having been sent from Burma.

BETULA.

47 **Betula Bhojpattra,** *Wall.*, CUPULIFERÆ

Vern.—*Bhujpattra,* HIND.; *Burj, bursal,* PB.; *Bhojpatra,* BOM.

A middle-sized tree, met with on the higher ranges of the Himalayas, altitude 14,000 feet.

The bark is used as a substitute for paper by some of the hill tribes, and is regarded as more durable than paper. It is brought down to the plains and largely used in the manufacture of hookah tubes. The young branches are plaited into twig bridges.

BIXA.

48 **Bixa Orellana,** *Linn.*, BIXINEÆ.

THE ARNOTTO DYE.

Vern.—*Latkhan,* HIND., BENG.; *Jarat,* ASS.; *Jafra,* TEL.; *Kuragúe mangjal,* TAM.; *Theedin,* BURM.

A graceful shrub, with handsome white or pinkish flowers and echinatred capsules; originally a native of America, now largely cultivated in India for the red or orange dye obtained from the pulp which surrounds the seed.

Bark yields a good cordage. (*Dymock.*)

BÆHMERIA.

49 **Bæhmeria Hamiltoniana,** *Wedd.*, URTICACEÆ.

Vern.—*Tuksur,* LEPCHA; *Sapsha,* BURM.

A shrub of North and East Bengal, and Burma.

It yields a strong fibre.

50 **B. macrophylla,** *Don.*

Vern.—*Saochála, golka,* KUMAUN; *Kamli,* NEPAL.

This broad-leaved shrub is met with from Kumaun eastward to the Khásia Hills.

Its bark yields a beautiful fibre, much prized for fishing nets.

51 **B. malabarica,** *Wedd.*

Vern.—*Takbret,* LEPCHA.

A shrub of moister zones of India and Burma.

It yields a strong fibre.

52 **B. nivea,** *H. & A.*

RHEA GRASS; CHINA GRASS.

Vern.—*Puia,* HIND.; *Riah,* BENG.; *Rhia, kunkhoora, ramic,* ASS.

This is, perhaps, the finest fibre in India, and the one which is likely soon to become commercially the most valuable. Its separation is at present very laborious and expensive. In 1871 a reward of £5,000 was offered by Government for a good extracting machine for this fibre; but although several competitors came forward, the prize was awarded to no one.

BOMBAX.

Bombax malabaricum, *DC.*, MALVACEÆ. 53

SILK COTTON TREE.

Vern.—*Simal,* HIND.; *Simul,* BENG.; *Simali,* SANS.; *Sa vara,* MAHR.; *Letpan,* BURM.

A large tree, with thorny buttressed stems, and large showy flowers, appearing in Bengal in January and February.

The seeds have short cottony hairs, too short to be spun, but largely used for stuffing pillows, &c. The inner bark also yields a good fibre, suitable for cordage.

BORASSUS.

Borassus flabelliformis, *Linn.*, PALMÆ. 54

PALMYRA PALM.

Vern.—*Tar,* HIND.; *Tal,* BENG.; *Tala,* SANS.; *Panam,* TAM.; *Tan,* BURM.

One of the most common palms of India.

The fibre extracted from the leaf-stalks is used for rope and twine-making, and may also be used for paper.

BROUSSONETIA.

Broussonetia papyrifera, *Vent.*, URTICACEÆ. 55

Vern.—*Malaing,* BURM.

A small tree, said to be wild in the Martaban hills.

The Japanese make paper from the bark of this tree, and the Burmese their curious papier mâché school slates (*Parabaik*). The Tapa Cloth of the South Sea Islands is made from it. The Karens prepare from it the Mulberry Paper Cloth, which see.

Burma should supply specimens of this bark, together with its manufactured products.

BUTEA.

Butea frondosa, *Roxb.*, LEGUMINOSÆ. 56

Vern.—*Dhak,* HIND.; *Palash,* BENG.; *Palása,* MAHR.; *Parasa,* TAM. *Pauk,* BURM.; *Khakar,* GUZ.

A small, distorted tree; covered with deep orange flowers before the appearance of the leaves. Met with all over India.

Yields a strong fibre, said to be useful for paper-making and for cordage; also the roots yield a strong fibre, which is used in some parts of India for making native sandals.

B. superba, *Roxb.* 57

Vern.—*Ligemotku,* TEL.; *Pálásável,* MAHR.; *Pauknwe,* BURM.

An extensive climber, scarcely differing from the preceding except in habit. Found in the forests of the Konkan, Bengal, Orissa and Burma.

CALAMUS.

58 **Calamus Rotang,** *Linn.*, PALMÆ.

THE RATTAN CANE.

Vern.—*Bet,* BENG., HIND.; *Bed,* PERS.; *Veta,* MAHR.; *Perambu,* TAM.; *Beta mu,* TEL.

It is met with in Bengal, Assam, South India, and Burma.

This is the species which yields the best Rattan Cane of commerce. Other species are, however, used as substitutes. It is split into strips and plaited or woven into baskets, chairs, sofas, and carriages. It is twisted into ropes, or stretched entire across rivers, as the main supports of indigenous suspension bridges.

CALLICARPA.

59 **Callicarpa cana,** *Linn.*, VERBENACEÆ.

Royle, in his *Fibrous Plants of India,* says that a fibre is prepared from this plant, called *Arúsha* in Chittagong. **Captain Thomson** reporting of this fibre says: "It is much too weak for either sail-cloth or cordage. It, however, possesses all the free and kindly nature of flax, and even smells like flax. It is easily worked, with little or no waste, &c." (*Royle, page 311.*)

Specimens of this fibre, as also of the plant, to facilitate fresh identification and experiments, much required.

CALOTROPIS.

60 **Calotropis gigantea,** *R. Br.*, ASCLEPIADACEÆ.

Vern.—*Madar,* HIND.; *Akanda,* BENG.; *Rúi, akra,* BOM.; *Erukam, yercum,* TAM.; *Mayo,* BURM.

A small shrub, common throughout India on the plains.

The silky hairs from the apex of the seeds are used for stuffing pillows, and may be used as a paper fibre. The fibre known as *Bowstring Hemp* is obtained from the stems, and is perhaps the most valuable, as it is the strongest, of Indian fibres. While this has been well known for many years and the fibre repeatedly brought to the notice of Europe, it has up to the present day not attracted the attention which it deserves.

Mr. G. W. Strettell of the Forest Department, in his *New Source of Revenue for India,* states that the Muddar must "afford a material for paper as good as, and cheaper than, Esparto." In this opinion he is strongly supported by the Curator of the Victoria and Albert Museum, Bombay, who pronounces this as one of the finest of Indian fibres, its extended use being restricted only by the difficulty of extraction. In the *Kew Report for 1881,* however, an opinion is expressed by **Mr. Routledge** quite opposed to this; he believes that "neither it (Muddar) nor any other exogenous plants of similar characters can ever compete with Esparto, nor be produced at a sufficiently low cost to admit of its being employed as paper-making material." Paper is prepared in the following districts: Bellary in Madras, Furruckabad and Meerut in North-Western Provinces. The plant is abundant in the Punjab, and, together with the next species, is to a small extent made into paper. The cotton or crown of hairs from the seeds, as also the fibre from the bark, or both, is capable of being used for paper.

When steeped in water the fibre rots quickly. The steaming process is likely to produce good results. The fibre was extracted in Mysore without the usual process of steeping. (*Cameron.*)

Calotropis procera, *R. Br.* 61

Vern.—The *Ak, mudár,* North India.

Common in the Punjab, Sind, &c., taking, in Upper or North India, the place which the preceding species holds in Bengal, the North-West Provinces and South India.

It may be used for the same purposes as the preceding.

CANNABIS.

Cannabis sativa, *Linn.,* Urticaceæ. 62

Hemp.

Vern.—*Ganjá, bháng, charas,* Hind., Beng., Bom., Tam.; *Ganjika.* Sans.; *Nabátul-qunnab,* Arab.; *Darakhte-kinnab,* Pers.; *Ganjair-chettu,* Tel.; *Sechauk,* Burm.

Rarely cultivated for its fibre in India, not being suited for cultivation in the plains. It is remarkable that the natives do not make an attempt to utilise the enormous quantities of inferior stems obtained from the seed crop as a paper fibre.

CAREYA.

Careya arborea, *Roxb.,* Myrtaceæ. 63

Vern.—*Kumbi, kumbh,* Hind.; *Dambel,* Garo; *Ayma, pailae,* Tam.; *Banbwe,* Burm.

A large tree found from the Jumna eastward to Bengal and Burma, and in Central and South India.

Its bark gives a good fibre for coarse cordage. (*Gamble.*)

It is used in Mysore as a slow match to ignite gunpowder. (*Cameron.*)

CARYOTA.

Caryota urens, *Linn.,* Palmæ. 64

Vern.—*Rungbong, simong,* Lepcha; *Bara flawar,* Ass.; *Salopa,* Uriya; *Bherlá-máda,* Mahr.; *Conda-panna, erim-panna,* Tam.; *Minbaw,* Burm.

A beautiful palm, with smooth, annulated stem, met with in the forests of the western and eastern moist zones.

The leaves give the *Kittul Fibre,* which is very strong and is made into ropes, brushes, brooms, baskets and other articles. The fibre from the sheathing petiole is made into ropes and fishing-nets, lines, &c. (*Gamble*), and is suitable for the manufacture of paper.

CELOSIA.

Celosia cristata, *Linn.,* Chenopodeæ. 65

Spons' Encyclopædia, page 938, remarks of this plant: "Common all over Bengal and North India generally.

"It yields a strong flexible fibre, so highly esteemed that rope made of it sells at five times the price of jute rope."

Confirmation of this fact required, and also samples of the plant from which the fibre has been extracted.

It is known in Bengali as *Lal-mugra,* but **Roxburgh** makes no mention of the fibre; indeed, no author seems to do so.

CEPHALOSTACHIUM.

66 **Cephalostachium capitatum,** *Munro,* GRAMINEÆ.

Vern.—*Gobia, gopi,* NEPAL; *Sili, sullea,* KHASIA.

This "bamboo has stems 12 to 30 feet, thin, yellow, semi-scandent, strong, with long internodes of about 2½ feet, used for bows and arrows by the Lepchas. It is often gregarious. It flowered in Sikkim in 1874." (*Gamble.*)

CERBERA.

67 **Cerbera Odollam,** *Gaertn.,* APOCYNEÆ.

Vern.—*Dabur, dhakur,* BENG.; *Kada-ma,* TAM.; *Kalwa,* BURM.

An evergreen tree of the coasts of India and Burma.

A fibre prepared from the bark is said to have been sent by the Forest Department of Madras to the Amsterdam Exhibition of 1883. (See *T. N. Mukharji's Amsterdam Descriptive List.*)

CHAMÆROPS.

68 **Chamærops Ritchieana,** *Griff.,* PALMÆ.

Vern.—*Masri,* TRANS-INDUS; *Kilu, kaliu,* SALT RANGE; *Pharra,* BELUCH.

Leaves used for matting, fans, baskets, hats and other articles. Its leaves and leaf-stalks give a strong, durable fibre which is made into ropes; and its seeds are used for rosaries. A beautiful collection of the products of this plant was sent to the Paris Exhibition from the Punjab, chiefly from the Salt Range. (*Gamble.*)

COCOS.

69 **Cocos nucifera,** *Linn.,* PALMÆ.

THE COIR OR COCOA-NUT FIBRE.

Vern.—*Nariel,* HIND.; *Narikel,* BENG.; *Tenna,* TAM.; *Ou,* BURM.

The thick pericarp yields the valuable Coir fibre of commerce. The sheaths of the leaves are used to wrap up articles, and as paper to write upon. The fibre of the leaf-stalks is also prepared, and seem likely to prove useful in the manufacture of paper.

CORCHORUS.

[147] **Corchorus olitorius,** *Linn.,* and **C. capsularis,** *Linn.,* TILIACEÆ. *See* **Jute.**

CORDIA.

Cordia Myxa, *Linn.*, BORAGINEÆ. 70

Vern.—*Lasora, bhokar, gondi,* HIND.; *Bohari, buhal,* BENG.; *Laswara,* PB.; *Lesuri,* SIND; *Borla,* KUMAUN; *Bokhar,* MAHR.; *Vidi, verasu,* TAM.; *Thanat,* BURM.

A moderate-sized tree of the Salt Range, the Sub-Himalayan tract from the Chenab to Assam, the Khásia Hills, Bengal, Burma, and Central and South India.

The bark is made into ropes, and the fibre is used for caulking boats; as also ropes and fuses are made from it.

C. Rothii, *Röm. & Sch.* 71

Vern.—*Gondi, gondui, gundi,* HIND.; *Liar,* SIND; *Narvilli,* TAM.

A small tree in the dry zones of North-West and South India.

The liber or inner bark is made into rope.

CORYPHA.

Corypha umbraculifera, *Linn.*, PALMÆ. 72

THE TALIPAT PALM.

Vern.—*Conda-pani,* TAM.; *Biné,* KAN.; *Tala,* CINGH.; *Pebin,* BURM.

A tall tree of Ceylon and the Malabar Coast. Cultivated in Benga and Burma.

The leaves are made into fans, mats and umbrellas, and are used for writing on, as also are those of **C. Taliera.**

CROTALARIA.

Crotalaria Burhia, *Hamilt.* 73

Vern.—*Sis, búta, bhata.* PB.

Is said by **Mr. Baden-Powell** to yield a good fibre for cordage; used in the Punjab.

Crotalaria juncea, *Linn.*, LEGUMINOSÆ. 74

SUNN or SUNN HEMP or INDIAN HEMP, BROWN HEMP, BOMBAY HEMP, WUCKOO-NAR (or TRAVANCORE FLAX), JUBBULPUR HEMP.

Syn.—C. TENUIFOLIA, *Roxb.*

Vern.—*San,* BENG.; *Ambádi,* BOM.; *Jenappa-nar,* TAM.; *Jenapa-nara,* TEL.; *Paiksan,* BURM.

Extensively cultivated all over India for its fibre, which is largely used for cordage, coarse cloth, and the waste fibre for paper. This fibre is too well known to require more than to be mentioned in the present enumeration.

Cymbopogon. *See* **Andropogon.** [19]

CYPERUS.

75 **Cyperus exaltatus,** *Retz.*, CYPERACEÆ.

Commonly found in Bengal and in the Peninsula of India.
Yields fibre.

76 **C. Iria,** *L.*

Vern.—*Buro-chkhooncha,* BENG.

A small shrub, native of Bengal, Nepal, and the Peninsula.
Yields a fibre.

77 **C. Pongarie,** *Rottb.*

Vern.—*Chumati patee.*

A shrub, common on the banks of the Ganges.

Mr. Cameron says that **Dr. Bidie** of Madras has manufactured good mats from this plant.

78 **C. tegetum,** *Roxb.*

Vern.—*Mudarktai,* BENG.

The Calcutta floor-mats are entirely made of this **Cyperus.** The culms are split into two or three, and then woven into mats upon a warp of threads previously stretched across the floor of a room. The mat-maker passes the culms with the hand alternately over and under the successive threads of the warp, and presses them home.

In different districts of India it is believed that two or three allied species are used for this purpose. In Madras the form **C. corymbosus** seems to be chiefly used. Specimens of all the grass-mats, with flowering tufts of the grass from which they are made, would make it possible to examine this subject thoroughly. As far as possible such specimens should be supplied.

DÆMIA.

79 **Dæmia extensa,** *R. Br.*, ASCLEPIADEÆ.

Syn.—ASCLEPIAS ECHINATA, *Roxb.*

Vern.—*Chagulbanti,* BENG.; *Utarana,* SIND.

A common climber with a fœtid scent; met with throughout India, ascending to 3,000 feet.

"Twining, shrubby. Found wild in Bengal and in the Himalaya (from Darjeeling to Nepal), and one of the commonest weeds in the Deccan. Its stem yields a fibre which has been recommended as a substitute for flax; it is said to be very fine and strong, and to have gained a medal at the Madras Exhibition, 1855." (*Spons' Enc.*)

Birdwood, in *Bombay Products,* remarks that it is the commonest weed in the Deccan, where it is called *Ootrun,* and that the late **Colonel Meadows Taylor** was the first to draw attention to its valuable fibre.

This seems a likely fibre for paper manufacture.

Information, and samples of rough and cleaned fibre, required.

DAPHNE.

80 **Daphne longifolia,** *Meisn.*, THYMELÆACEÆ.

Vern.—*Shedbarwa,* NEPAL.

A shrub of Eastern Himalaya, Khásia Hills and East Bengal.
The bark is used in the manufacture of Nepal paper.

Daphne papyracea, *Wall.* 81

Syn.—D. CANNABINA.

Vern.—*Set barúwa, satpura,* HIND.; *Niggi,* PB.; *Balwa,* KUMAUN; *Gande, kaghuti,* NEPAL; *Dayshing,* BHUTIA.

A large shrub or small tree found on the Himalaya from the Indus to Bhutan, between altitudes of 3,000 and 9,000 feet; also on the Khásia and Naga Hills; one of the most abundant bushes on the hills between Manipur and Burma.

From the bark of this plant is prepared the curious Nepal paper, also strong ropes. Paper-making is not known to the Nagas, who use the fibre entirely for ropes. It would be interesting to know if **D. mucronata,** *Royle* (VERN. *Pech,* Sind; *kutilál, kantha, shalangri, sosho, shing, mashur, swána, jikri, dona, kágsarí, kansián, sonái,* Pb.) is ever used as a paper fibre in Sind or the Punjab, where it is plentiful enough on the hills and lower Himalaya.

D. Wallichii, *Meisn.* 82

Vern.—*Chhota aryili,* NEPAL.

A shrub of the Eastern Himalaya, Khásia Hills and East Bengal. The bark is used in the manufacture of paper.

DEBREGEASIA.

Debregeasia bicolar, *Wedd.,* URTICACEÆ. 83

Vern.—*Chainchar, chainjli, amrer,* JHELUM; *Sansaru, suss,* CHENAB; *Siaru, talsiari,* RAVI; *Pincho,* SUTLEJ; *Kharwala, shakai,* AFG.

A large shrub of the Salt Range and the North-West Himalaya, ascending to altitude 5,000 feet.

The fibre is made into twine and ropes.

D. leucophylla, *Wedd.* 84

Vern.—*Puruni,* NEPAL; *Senen,* LEPCHA.

A small tree of the North-East Himalaya up to 7,000 feet in altitude; Khásia Hills and the forests of Pegu.

Fibre sometimes used for cordage.

D. longifolia, *Wedd.* 85

Syn.—CONOCEPHALUS NIVEUS.

Vern.—*Tashiari,* NEPAL; *Ramhyem,* LEPCHA; *Putchaw,* BURM.

A small tree of the North-East Himalaya to the Khásia Hills, altitude 7,000 feet, South India and Burma.

The fibre of the bark is occasionally used for ropes, and to make fishing nets.

DENDROCALAMUS.

Dendrocalamus Hamiltonii, *Nees,* GRAMINEÆ. 86

Vern.—*Kokwa,* BENG.; *Tama,* NEPAL; *Pas,* LEPCHA; *Wah,* MECHI; *Wahnok,* GARO.

The common bamboo of the East Himalaya. Stems 40 to 60 feet high or low and tangled. They are 3 to 6 inches in diameter, not straight, but are used for a variety of purposes.

87 **Dendrocalamus strictus,** *Nees.*

Syn.—BAMBUSA STRICTA.

Vern.—*Bans, bans kaban, kopar,* HIND.; *Karail,* BENG.; *Bas, udha,* BOM.; *Kanka,* TEL.; *Myinwa,* BURM.

This bamboo has often deciduous leaves; the stems are strong, elastic, and nearly solid, 20 to 100 feet high.

Used for spear-handles and all purposes of house-building, baskets, &c. (*Gamble.*)

DESMODIUM.

88 **Desmodium tiliæfolium,** *G. Don.*, LEGUMINOSÆ.

Vern.—*Sambar, shamru, chamra, martan, motha, pri, murt, laber,* HIND.

A large tree, met with all along the Himalaya, from the Upper Punjab to Tavoy, in both temperate and tropical zones; ascending to 9,000 feet in altitude.

The bark yields an excellent fibre, extensively used for rope-making; suitable for paper manufacture.

DOLICHANDRONE.

89 **Dolichandrone falcata,** *Seem.*, BIGNONIACEÆ.

Vern.—*Hawar,* OUDH; *Kanseri,* MEYWAR; *Udda, wodi,* TEL.

A small tree; native of Oudh, Rajputana, Central and South India.

A fibre obtained from this plant was sent to the Amsterdam Exhibition by the Forest Department of Madras. (See *T. N. Mukharji's Descriptive Catalogue.*)

90 **D. Rheedii,** *Seem.*

Syn.—SPATHODEA RHEEDII, *Wall.*

Vern.—*Deya-danga,* CINGH.; *Thakutma,* BURM.

A small tree, met with in Burma, Ceylon, and the Andaman Islands.

Yields a fibre similar to the preceding.

DOMBEYA.

91 **Dombeya umbellata,** STERCULIACEÆ.

Introduced from the Isle of Bourbon, and sparsely cultivated as an ornamental bush.

The bark yields a good fibre. **Dombeya cannabina,** a native of Madagascar, yields a strong fibre, locally made into rough ropes.

DREGEA.

92 **Dregea volubilis,** *Benth.*, ASCLEPIADEÆ.

Syn.—ASCLEPIAS VOLUBILIS, *Roxb.*; HOYA VIRIDIFLORA, *R. Br.*

Vern.—*Tit-kunga,* BENG.; *Hirandodi,* MAHR; *Dúdi-palla,* TEL.

A large, woody, twining plant, common in hedges and thickets; flowers small, greenish, appearing in May; met with in Bengal, Bombay, and South India.

Contains a good fibre, sometimes extracted by the natives.

Dunchi Fibre. *See* **Sesbania aculeata.**

EDGEWORTHIA.

Edgeworthia Gardneri, *Meisn.*, THYMELÆACEÆ. 93

Vern.—*Kaghuti, aryili,* NEPAL.

A large, elegant bush, almost leafless when covered with its clusters of yellow, sweet-scented flowers. Found along the Himalaya from Nepal to Sikkim and Bhutan, and recently found plentiful on the mountains of Manipur, extending to the northern frontier of Burma.

The strong, tough fibre obtained from the long, straight, sparsely-branched twigs of this bush must, sooner or later, become one of the most valuable of Indian fibres. The finest Nepal Paper is made from it, and is purer and cleaner than the paper from **Daphne papyracea.**

Eria. *See* Silk. [218]

ERIODENDRON.

Eriodendron anfractuosum, *DC.*, MALVACEÆ. 94

THE WHITE COTTON TREE.

Vern.—*Safed simal, senibal, hatián, katan,* HIND.; *Shwet simul,* BENG.; *Ilavam,* TAM.

A tall, deciduous tree of India and Burma, found throughout the hotter parts.

The seeds are coated with soft, silky hairs. In South Canara a fibre is extracted from the plant, which is suitable for the manufacture of paper.

ERIOLÆNA.

Eriolæna Hookeriana, *W. & A.*, STERCULIACEÆ. 95

Vern.—*Nar-botku,* TEL.; *Arang,* BERAR; *Kutki, bhonder,* GOND.

A small tree of Central and South India.

The bark yields a good fibre A specimen was sent to the Paris Exhibition of 1878.

E. spectabilis, *Planch.* 96

Vern.—*Nar-botku,* TEL.; *Arang,* BERAR; *Kutki, bhonder,* GOND.

A small tree of the Central Himalaya to Nepal, found plentifully everywhere on the dry, red clay hills in the arid districts of Manipur.

The bark yields a good fibre.

ERIOPHORUM.

Eriophorum comosum, *Wall.*, CYPERACEÆ. 97

Syn.—SCIRPUS COMOSUS, *Roxb.*

Vern.—*Bhábar, bab, babila,* N. W. P.; *Pan-babiyo,* ALMORA.

This plant forms a small proportion of the fibre brought down to the plains under the name of *Bhábar,* the bulk being the fibre from **Spodiopogon angustifolius,** *Trin.* (*Atkinson.*) But for the expense of transport to the commercial centres, this grass would become one of the most useful of Indian paper fibres. It is abundant in the North-West Provinces.

Eriophorum is not far behind Esparto in the yield of dry fibre, and is quite equal to it in strength.

ERYTHRINA.

98 **Erythrina indica,** *Lam.*

Vern.—*Pángrá,* HIND.; *Palitá-mádár,* BENG.; *Pángará,* MAHR.; *Kalyáná-murukku,* TAM.; *Badidapu-chettu,* TEL.; *Erabadu-gaha,* CINGH.; *Kathit,* BURM.

It is stated that the bark yields a fibre. (*Capt. Nutt's Report in Liotard's Memorandum.*)

160-161] **Esparto Grass.** *See* **Lygeum Spartum** and **Macrochloa tenacissima.**

EUCALYPTUS.

99 **Eucalyptus Globulus,** *Labill.,* MYRTACEÆ.

Vern.—*Kurpoora maram,* MADRAS.

A lofty tree, gregarious in Victoria and the south of Tasmania. Introduced on the Nilgiris, and now completely naturalised.

The bark of the tree forms the paper material.

FICUS.

100 **Ficus bengalensis,** *Linn.,* URTICACEÆ.

THE BANYAN TREE.

Vern.—*Bar,* HIND.; *Bat,* BENG.; *Bor, joribor,* ASS.; *Alamarum,* TAM.; *Pyinyaung,* BURM.

One of the most characteristic of Indian trees, in many cases each forming a forest in itself from its habit of sending down roots from the branches. A coarse rope is made from the bark and from the aerial roots, and paper is also reported to have been formerly largely prepared in Assam from the bark; to a small extent it is stated to be still prepared at Lakhimpore in Assam and in Bellary in Madras. Specimens of this paper, as also a description of the process of preparation and the extent of the trade in this paper, would be most acceptable.

101 **F. Cunia,** *Buch.*

Vern.—*Khewnau, khurhur,* HIND.; *Dumbur, yajya-domur,* BENG.; *Kunia,* KUMAUN; *Kanhya,* NEPAL.

A moderate-sized tree of the Sub-Himalayan tract, from the Chenab eastward, ascending to 4,000 feet in altitude, Bengal, Burma.

The bark is used to tie the rafters of native houses.

102 **F. infectoria,** *Willd.*

Vern.—*Pakur,* HIND., BENG.; *Gándhaumbara, dhedumbara,* MAHR.; *Pepre, kurku,* TAM.; *Nyoungchin,* BURM.

A large tree of Bengal, Central India, and Burma.

The bark yields a fibre.

Ficus religiosa, *Linn.* 103

THE PIPAL TREE.

Vern.—*Pipal,* HIND.; *Ashathwa,* BENG.; *Arasa,* TAM.; *Nyaùngbawdi,* BURM.

A large tree regarded as sacred, found all over India.

A fibre is extracted from the bark. Formerly, the fibre was made into paper in Burma and used in making the peculiar green umbrellas of the people; but the manufacture has died out, and the umbrellas are now imported from China.

F. Tsiela, *Roxb.* 104

Vern.—*Jóvi* or *peddi-jóvi,* TEL.

This, **Roxburgh** remarks, is, next to **F. religiosa,** the largest species of Indian fig. It is a large handsome tree, with smooth bark, wholly glabrous. It is a native of the lower hills of Bengal and South India, but in cultivation for shade is met with along the roads throughout India

The bark gives a good fibre.

FOURCROYA.

Fourcroya gigantea and **F. longæva,** AMARYLLIDEÆ. 105

These and Adam's Needle (**Yucca gloriosa**) are closely allied to **Agave americana.** They are all members of South America, Mexico, and the West Indies. **F. longæva** is the finest member of the genus, if not of the order. Its flowering axis rises to 30 or 40 feet, and is covered with flowers. **F. gigantea** was formerly called **Agave fœtida**; it is a much smaller plant than the foregoing. It has been successfully introduced into the Madras Presidency, and seems to grow freely enough. It is known as the Great Aloe or, in Tamil, *Simai-kathalai.*

They all yield fibre of a very excellent kind, and seem likely to develope into fibre-yielding plants of the greatest importance; certain, sooner or later, to be cultivated in India.

GERBERA.

Gerbera lanuginosa, *Benth.,* COMPOSITÆ. 106

Vern.—*Kapasiya,* the name of the tinder prepared from the tomentum of the leaves. *Kupasi* is also the name of a cloth spun from this curious plant.

It is a herbaceous procumbent plant of the lower slopes of the Western Himalaya, having large, simple, ovate, oblong leaves, lyrately pinnate at the base.

From the under-surface the tomentum is peeled off and used as tinder by the hill tribes, or spun into a woolly-like twine and then woven into the characteristic bags in which they carry their hookahs. Specimens should be obtained from Kumaun.

GIRARDINIA.

Girardinia heterophylla, *Decaisne,* URTICACEÆ. 107

THE NILGIRI NETTLE.

Syn.—URTICA HETEROPHYLLA, *Roxb. iii.,* 586.

Vern.—*Awa, alla, bichua,* HIND.; *Keri, kingi, sanoli, au, ján, kárla,* PB.; *Ullo,* NEPAL; *Kazu,* LEPCHA; *Horu surat,* ASS.; *Serpa, herpa,* BHUTIA.

An exceedingly common, large, herbaceous plant of the forests, with long stinging bristles. It is common throughout most of the hill districts of India and Burma, but especially upon the Himalaya.

It affords a fine, silky fibre, used in Sikkim for ropes and coarse cloth resembling Gunny. (*Gamble.*) **Roxburgh** says of it: "The bark abounds in fine, white, glossy, silk-like, strong fibres."

GNETUM.

108 **Gnetum scandens,** *Roxb.*, GNETACEÆ.

Syn.—G. EDULE, *Bl.*

Vern.—*Rúmbal, úmble,* BOM.; *Pilita,* AND.; *Naun-with,* SYLHET; *Gyootnway,* BURM.

A large climbing shrub of Sikkim, and the Khásia Hills, East Bengal, Western Ghâts, Burma, and the Andamans.

In the Andaman Islands the fibre is used for the preparation of hard fishing-nets called *Kud.*

GOSSYPIUM.

109 **Gossypium,** a genus of MALVACEÆ, yielding the valuable fibre known as COTTON.

Considerable difference of opinion prevails as to the origin of the plants now cultivated for the supply of cotton, and, indeed, the original home of the ancestral type or types from which it was derived, is by no means certain. The *Flora of British India* regards the form collected by **Stocks** and **Dalzell** upon the limestone rocks of the coast of Sind as a wild species, to which the name of **G. Stocksii,** *Mast.*, has been given.

This establishes the existence of the genus **Gossypium** as indigenous to India. Whatever may be the origin or history of the cotton plants as a whole, a careful examination of a large collection of dried specimens will, it is thought, justify the separation of the Indian cultivated forms into three sections, which, for convenience, we may regard as species. These are **G. arboreum,** *L.*; **G. herbaceum,** *L.*; and **G. barbadense,** *L.*; and we propose to retain the synonymy and the varieties under these as established in the *Flora of British India,* merely suggesting the advisability of transferring **Var. religiosum,** *sp., Roxb.*, from **G. herbaceum,** *L.*, to **G. barbadense,** *L.* It seems probable that the form **G. hirsutum,** *sp., L.*, is really a hybrid, having the foliage of **G. herbaceum,** and the gashed bracteoles of **G. barbadense.** It may be placed, therefore, under either of these species.

110 **G. arboreum,** *L.*

Diagnostic characters.

Leaves, more or less hairy, ¾ segmented, or almost cut to the base into 5 or 7 lobes, mostly 5, never 3. *Segments,* contracted at the base, narrow, ovate, linear, acuminate, or ovate lanceolate, *not ¼ as broad as long, central lobe often having a small, supplementary segment, or tooth, in the deep-rounded lateral sinus. Bracteoles, ovate, cordate acute, toothed or entire. Flowers,* purple with yellow centre, rarely white. *Seeds,* free from each other, covered with white cotton overlying a dense green down; *cotton,* not readily separable from the seed.

(Compare with diagnosis of **G. herbaceum,** page 25 and of **G. barbadense,** page 23).

The supplementary teeth on either side of the middle, or odd, lobe of the leaf forms a most peculiar character, and in many cases a ready eye-mark in the separation of this from the next species. There is often con-

GOSSYPIUM. (COTTON

siderable difficulty, however, in separating the forms of **G. herbaceum** from **G. arboreum**, and there cannot be a doubt that they are intimately related to each other, if not derived, as cultivated forms, from the same ancestor, It seems very probable that they are indigenous to Asia, if not to India.

General Account.

G. arboreum, *L.*, is a common plant, being still (as **Roxburgh** wrote eighty years ago), "found in the gardens of the curious over most parts of India, where it is in flower the greater part of the year." It does not appear to be cultivated on account of its cotton. It sometimes attains the height of a small tree; more frequently it is a densely-branched bush with purple flowers, often having a yellow centre. It is said to be found indigenous or cultivated in the Island of Celebes, in Arabia, Egypt, and India. **Royle** says it is known in India generally as *Nurma barre*, and in Mysore as *Deo kupas;* that it may be cultivated like the ordinary cotton; and that turbans were formerly made from it and regarded as sacred. It is probable that **Royle** was labouring under a misapprehension; his plate No. 23 probably represents two forms of **G. herbaceum** instead of a twig of **G. arboreum** and one of **G. herbaceum**. **Ainslie** says that **G. arboreum** is known as *Shem-paratie* in Tamil. It is very likely indeed that there are many cultivated hybrids between **G. arboreum** and **G. herbaceum**. **Mr. Duncan** describes a large bushy form (very probably a hybrid) in the Benares district, which yields cotton for five or six years, and is there known as *Nurmah*. It is also reported to be cultivated at Malwa and at Calpee in the gardens belonging to the Rajah of Jalaun. **Mr. Bruce** supposes the Chundere Muslins to have been made from the cotton of this plant (**G. arboreum**).

Note.

It would tend greatly to remove difficulties were specimens of this plant, together with its pods (and yarns or fabrics, if they exist) to be supplied for the approaching Exhibition. A thorough investigation of the forms of Indian cotton can be made only by obtaining dried specimens, showing leaves and flowers along with the pods. These can easily enough be prepared by pressing, between blotting paper, until dry, a flowering twig from the actual plant from which the corresponding pods have been obtained.

G. barbadense, *Linn.* III

Diagnostic characters.

Leaves, sub-glabrous, broader, and more cordate than the preceding species, with rounded ears at the base, about ⅓ segmented (or a little more) into 3 to 5 lobes; *lobes*, broad, ovate, acuminate more than ½ as broad as long (often very acuminate and then almost sub-lanceolate). *Bracteoles*, larger and broader than in the preceding species, obtuse, deeply lancinate. *Flowers*, yellow, with a crimson spot. *Seeds*, black, naked, *i.e.*, destitute of adnate pubescence, free from each other or cohering in a kidney-shaped mass. *Cotton*, readily separable from the seeds, white, tawny, or almost brown.

The upper leaves in all the forms of this species are often only angled, and, indeed, the main feature of the leaves of this plant is that they are broader and much more entire than in either **G. arboreum** or **G. herbaceum**. The lower leaves are 3 to 5 lobed, the lobes broad and often suddenly acuminate, the sinus acute, not rounded, and never possessed of supplementary teeth. The bracteoles in outline are almost obtuse, instead of acute and are deeply gashed. I have followed the *Flora of British India* in including under this species **G. acuminatum**, *Roxb. sp.*—the Peruvian Cotton, hence the necessity of the extra character of the lobes of the leaves, "*often very acuminate, and then almost sub-lanceolate.*" **Royle** kept this distinct from the Bourbon Cottons, and from an economic point of view it would seem that this is the more natural course, for, in addition to the leaves being more deeply segmented, the seeds have the peculiar character of cohering together in a kidney-shaped mass, hence generally known as Kidney Cotton. I propose, therefore, to refer the varieties and sub-varieties or cultivated forms of **G. barbadense** to two sections:

112

1st.—Var. **barbadense** *proper.*

This corresponds with the section known as the BOURBON COTTONS.

This is supposed to have been originally introduced into India from the Isle of Bourbon, hence the name Bourbon Cotton. As far as can be traced it was first introduced into India about 1790. Probably it was originally a native of the West Indies, and was introduced by the French into the Mauritius and Bourbon as early as 1780.

It includes many important forms, of which the following may be mentioned:—

(*a*) BOURBON COTTON.—**Royle** states that this was first successfully introduced into Guzerat. It is described as growing into a large much-branched bush, flowering for a series of years. In 1818 **Mr. Gilders** succeeded in cultivating it in the eastern districts of Kaira, on light, sandy soil. **Mr. Hale** reports about the same time its successful cultivation at Malwa. Subsequent writers affirm that in Guzerat Bourbon Cotton has become naturalised.

(*b*) BARBADOES.
(*c*) NEW ORLEANS.
(*d*) SEA ISLAND.
(*e*) UPLANDS.
(*f*) EGYPTIAN.
(*g*) GEORGIAN.
(*h*) FLORIDA.
(*i*) ALABAMA.

Perhaps (*c*) and (*d*) are commercially the most valuable forms, especially the New Orleans, which commands the highest price in Europe. The much-prized Dharwar is a form of the New Orleans Cotton.

There are many other cultivated forms, too numerous to be mentioned here, of which we have little or no information relating to India. Indeed, little is known of those mentioned, and samples and information as to the extent of their cultivation will be most acceptable.

113

2nd.—Var. **religiosum,** *Roxb., sp.*

This corresponds with the NANKEEN COTTON.

This is the Nankeen Cotton of **Roxburgh,** and seems to be a form introduced to India at a much earlier date than the forms which I have referred to the preceding variety. Its distinguishing feature seems to be that the seeds are clothed with a tawny pubescence and enclosed in cotton of the same colour. I have arrived at the conclusion that this should be placed under **G. barbadense** mainly from the fact that the entire set of sheets in the Calcutta Botanic Garden Herbarium (bearing the name of **G. religiosum**), are most unquestionably forms of **G. barbadense,** having the less hairy, broader leaves and deeply segmented bracteoles of that species. It is quite possible that these sheets are wrongly named **G. religiosum,** but in support of this departure from the *Flora of British India,* I would point out that **Roxburgh** remarks, under his **G.**

religiosum, that "this can scarcely be more than a variety of **G. hirsutum**," while in a concluding note upon **Gossypium**, he says that, having carefully studied the Indian Cottons for a period of over thirty years, he had come to the conclusion that there were five species peculiar to Asia. "**G. barbadense**" and "**hirsutum**" being natives of America were not regarded by him as Indian forms. He included **G. religiosum** among his indigenous Asiatic species, and in this view he may be quite right; but it seems natural that, whether indigenous or only an earlier introduction, **G. religiosum** should be viewed as more nearly allied to **G. barbadense** than to **G. herbaceum**, since **Roxburgh** viewed it as doubtfully distinct from **G. hirsutum**, a form which he distinctly states to have come from America.

3rd.—Var. **acumintaum.** *Roxb., sp.* 114

This section includes the PERUVIAN or KIDNEY COTTON.

These Cottons are distinguished chiefly by the peculiarity of the black naked seeds cohering together in a kidney-shaped mass. Some of the forms have long been introduced into India. In fact, **Roxburgh** viewed **G. acuminatum** as an indigenous plant. It is, however, probable that, as with **G. religiosum**, this is but an early introduction. **G. peruvianum** is the scientific name under which the Peruvian Cottons are classed. The following are the principal commercial forms:—

(*a*) BRAZILIAN.
(*b*) PERNAMBUCO.
(*c*) MARANHAM.
(*d*) PERUVIAN.

Hybrids.

It seems probable that the favourite New Orleans Cotton is a hybrid between **G. herbaceum** and **G. barbadense**, reared in America, and that this is the plant which received the botanical name of **G. hirsutum**, *Willd.* It is chiefly characterised by having greenish seeds surrounded with fine long silky cotton. This form has been most successfully introduced in the Dharwar country, in the south of the Bombay Presidency. (see also Section 2nd, page 29.)

It is very much to be regretted that an enumeration of the Indian hybrid forms cannot be obtained from the existing literature on this all-important staple, and it is hoped that the present enquiry, tabulated in a systematic form, may elicit much valuable information.

G. herbaceum, *L.* 115

Diagnostic characters.

Leaves, hairy, often quite hirsute, about ½ segmented into 3 to 5, mostly 3, lobes; *lobes*, ovate, oblong, acute or acuminate, *about ½ as broad as long. Bracteoles, ovate, cordate, acute, toothed or entire. Flowers*, yellow with a purple centre, rarely wholly yellow or white or purple. *Seeds*, ovoid, free from each other, covered with greenish or greyish down; *cotton*, white.

The most characteristic features of this plant are its hairiness, the leaves only ½ segmented, segments often 3, generally 5, very rarely, if ever, 7. It has the bracteoles of **G. arboreum**; indeed, purple-flowered forms can with difficulty be separated. It was probably a purple-flowered form of this plant, or a hybrid form, which **Royle** mistook for **G. arboreum**, and which he figured and described as the plant that yielded the cotton made into turbans. It may be easily enough separated, however, by comparing the aggregate of existing characters with those of the typical **G. arboreum.** Thus, even in the cases where the flowers are purple or white (in both species), the deeply-segmented leaves with more numerous, longer, and narrower lobes, of **G. arboreum** when taken along with its less hairy character and more arborescent habit, would prove sufficient to separate that species from **G. herbaceum.** The presence of the supplementary tooth in the sinus on either side of the odd or terminal lobe would, however, remove all possible doubt, for, while this character may not be present in every leaf of **G. arboreum**, it is often so, and, as far as my experience goes, is never met with in **G. herbaceum.**

General Account.

This is the species to which all the forms of purely indigenous cotton-yielding plants in India unquestionably belong. There can be no doubt, however, that there are many hybrids between this plant and **G. barbadense,** *Linn.*, or between it and **G. arboreum.** These may be referred to two sets, *viz.*, those naturally produced by insects or wind, probably prior to the arrival of the English in India, and those naturally or artificially produced as the result, directly or indirectly, of the experiments conducted by the British Government in India with a view to improve the Indian cottons. There can be no doubt that there are hybrids which were widely cultivated before **Roxburgh** commenced to study them. But **G. barbadense** may have been originally a native of India or, at least, of Asia, and some of the forms of that species now met with in India may be truly indigenous, as also the hybrids between these and the forms of **G. herbaceum.** There are many instances of plants that are indigenous both to America and to Asia, such as the species of *Musa* (the plantain); it is, therefore, not impossible that **G. barbadense** may have been indigenous to some part of Asia, if not to India itself, as well as to America. At the same time it seems more than probable that all the forms of that species came originally from America; but if so, **G. barbadense** must have reached India long before the arrival of the English. We have many other such instances of importation from America to India at early dates, such as the common *Sheal kanta* (**Argemone mexicana**), the pine-apple (**Ananassa sativa**) and many others. The probability is that **G. barbadense** is a truly American species, but we have in India many forms of it, of so ancient a date as in some instances to have been viewed by **Roxburgh** as indigenous species. I propose to separate these varieties, as far as possible, from those of **G. herbaceum**, but there are some hybrids with regard to which it is impossible to decide whether they should be classed with American or with Indian Cotton. The following are the principal forms of Indian Cotton or the varieties of **G. herbaceum**:—

116 *1st.—Var.* **herbaceum** *proper.*

The diagnostic characters already given are those by which this form may be recognised.

Vern.—*Rui,* HIND.; *Kapas,* BENG., DEC.; *Rui,* PB.; *Karpasi,* SANS.; *Pambah,* PERS.; *Kurtam ussul,* ARAB.; *Vun-paratie,* TAM.; *Pautie,* TEL.

The forms under this variety have been referred to three primary groups originally formed by **Dr. Roxburgh,** and although much has been attempted for Cotton, it is to be regretted that no better classification can be suggested at the present day than that adopted by the father of Indian Botany.

GOSSYPIUM. (COTTON

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Section 1st.—BENGAL OR DACCA COTTON.

This furnishes, with others, the long staple formerly woven into the exquisitely fine muslins for which the eastern capital is famous. Dacca Cotton proper is regarded commercially as the first quality of Indian Cotton. The chief vernacular names for the Cottons of Bengal denoting the staples of varying quality and value met with in the different districts were given as follows in 1790 by **Mr. Bebb** in his account of the Cotton trade of Dacca:—

1st.—Phootee, furnishing the finest yarn; is sown in October, and again in the following April, after the crop from the previous sowing has been gathered. It is an annual, attaining a height of 20 or 30 inches.

2nd.—Bhyratti, next, if not equal; grows to 2 or 4 feet, and is sown in October. Capsule large, fibre short, said to have been produced in Mymensingh.

3rd.—Nurma.—**Mr. Bebb** then mentions the Surat imported Cottons as next in merit.

4th.—Serougee from Mirzapore, nearly as good as Surat.

5th.—Boga and other coarse Bengal Cottons, known chiefly by the name of the district where cultivated. That from the eastward of Dacca and north of the Bramhaputra on the low hills of Carrybarry is the best. The capsule is described as larger than *Bhyratti,* the fibre shorter and coarser.

In 1860, **Mr. I. S. Wise,** writing of Dacca Cottons, refers them to the following:—

1st.—Boraïlli, the finest Cotton procurable, and the largest Cotton plant, growing often to 8 or 10 feet, bearing pods every month for three or four years. Seems to be grown chiefly on the lowlands.

This description seems to apply more correctly to **G. arboreum,** or to a hybrid of that species, than to **G. herbaceum.** Specimens of plants and pods, if still known, would prove exceedingly interesting.

2nd.—" *Sheraj* Cotton is entirely a hill species, brought from Assam, and probably from the western hills of the Garo Range; it is considered second in quality."

3rd.—Dacca *Tanjore* Cotton, grown in high lands of red clay soil to the north of Dacca.

4th.—" The ordinary Country or Indigenous Cotton of Dacca" is a very different and inferior plant. This is probably the form called by other writers the *Dhera* Cotton. Of this Country Cotton there seems to be two kinds, *Dera* or *Dhera,* sown in July, and *Dhannah,* sown broadcast even along with other crops in March.

It seems probable that **Mr. Wise,** in speaking of Country or Indigenous Cotton as inferior to the varieties mentioned and described as of better quality, did not mean to suggest that the latter were not indigenous to India, but rather that the inferior qualities were strictly indigenous to the Dacca district. It is quite possible, however, that he meant that the better class Cottons were not indigenous to India but exotics; in which case some of the preceding forms of Dacca Cotton may have to be removed from **G. herbaceum** and placed under **G. barbadense.**

Most districts of Eastern and Northern Bengal and Chutia Nagpur produce coarse cottons, generally known by the name of the district where each is cultivated.

In Benares **Mr. Duncan,** in 1790, mentions the following varieties in the order of their importance:—

1st.—Rarreah or *buroweh,* giving ¼ *rui* or clean cotton, sown in August, and reaped in March or April. Requires good rich soil and plenty of water.

GOSSY-
PIUM.
OTTON.)

2nd.—Nurma, about equal in value to the preceding and far superior to the following variety. This is described as not being a regular crop but a plant which continues to grow for many years. This, therefore, is probably a form of G. **arboreum.**

3rd.—Munnoah or *Jettor*, inferior to the former, yielding only ⅛th cotton, but is sown broadcast with other crops: most probably the common *Dera* or *Desi* Cotton of other districts. In 1848, the Collector of Benares mentions the *Rarea* and *Mannoa*, but takes no notice of *Nurma*, which has apparently ceased to be cultivated as a cotton-yielding plant. This is exceedingly curious and requires confirmation.

In Gorakhpur **Mr. Blount** mentions the following kinds —

1st.—Kokte, described as a species of *Nankeen*, and should, therefore, occur under G. **barbadense.**

2nd.—Murwa, generally grown on narrow strips of ground round vegetable gardens, and is triennial or perennial. This may prove to be G. **arboreum** or one of its hybrids. To that species probably the *Nurma* of Benares and other districts belongs.

3rd.—Desi, the Common Cotton, sown in June, reaped in April following.

In Nagpore two kinds of cotton are mentioned, *Rarea* and *Munnoa.*

General Account.

The preceding are the vernacular names mentioned by authors as given to Bengal or Dacca Cotton, cultivated over Bengal, Assam, Burma, the North-West Provinces, and the Punjab. Before proceeding to the second class of Indian Cottons formed by **Roxburgh** it is necessary to point out the exceedingly imperfect character of the information contained in this compilation, and to explain that it is given merely as a fair summary of the information available up to the present date, and published in the hope that its manifest imperfections may suggest corrections and additions on the part of the officers deputed to make the collections for the forthcoming International Exhibition. It is quite possible, and indeed certain, that many of the vernacular names here enumerated do not belong to G. **herbaceum.** The primary object of the present effort is to bring about a scientific classification of the Indian indigenous and exotic Cottons and of their hybrids, in which all the known cultivated forms should be correctly referred to their proper botanical species. It is believed that no real good can be accomplished until this has been done, since everything depends on knowing whether a form recommended for experimental cultivation is suited to a particular district. This can be done only after the different forms of Cotton have been scientifically worked up, and the degree of hybridization with exotic forms has been clearly established. Indeed, it is impossible to write with any degree of confidence regarding this—one of the most important of Indian crops, since it is impossible to know what is referred to by writers upon Cotton under the various local and vernacular names. Thus, for example, a Magistrate and Collector writing of *Nurma* Cotton may be understood to be speaking of the ornamental but apparently non-cotton-yielding species G. **arboreum**, or of some hybrid between that and G. **herbaceum**, or of a hybrid with G. **barbadense**, if not of a variety of the Common Cotton with purple instead of yellow flowers.

We do not know at present whether G. **arboreum** is a cotton-yielding plant or not. **Royle** says that in his time it was known to yield Cotton and bore the name of *Nurma*; we hear of its being the best cotton-yielding plant; but other authors assert that it is entirely an ornamental and not a cotton-yielding species.

GOSSYPIUM. (COTTO

Concluding Note.

Much has been done to discover the soils suited for Cotton, and many valuable experiments have been made by Government with exotic forms, but what would appear to be the first and most natural enquiry has, apparently, been entirely neglected, namely, a scientific and exhaustive enquiry into the existing forms of Indian Cotton with a view to suggesting improvements in the indigenous crop—such as the supply of better seed from one district to replace the inferior kinds in another, improved modes of cultivation and of cleaning the fibre. It does seem strange that in the country that once supplied Europe with its manufactured cotton and raw staple, there should exist neglected forms which have been lost or allowed to decline and become unknown in less than a century through the reaction of English prosperity in Cotton manufactures.

It is hoped that at the forthcoming International Exhibition such a display of Cottons will be exhibited as may awaken a new interest in this staple. In order to assist in the accurate identification of the forms, it is earnestly solicited that a flowering twig, with a few well-formed leaves and one or two flowers, may be supplied along with the pods and fibre. These, as already explained, may with very little trouble be dried for a week between a few sheets of blotting paper, the paper being changed once or twice, when the specimens will be perfectly dry and ready for transmission to Calcutta. If this cannot be undertaken, a twig should be placed in a small box and despatched to Calcutta by post, having been first carefully numbered or named, so that it may be recognised as the plant from which a certain pod or staple was obtained.

We now come to the consideration of the second group of indigenous Indian Cottons.

Section 2nd.—BERAR AND SURAT COTTON. 118

This is the Cotton obtained from Berar. It is exported chiefly to the Madras Presidency, to be made into the so-called Northern Circar Long-cloth. The fine cloths of Chundere are made of this Cotton. **Dr. Irvine**, some time ago settled in Gwalior, says that this Cotton is known as *Nurma*, but its real name seems to be *Berari*. In the eastern districts of Guzerat the Cotton is known generally as *Kunum* or *Lulliah*, and is of a very superior description.

Broach or Surat Cotton is very fine, the pods hanging from the plant. They are distinguished chiefly as "Hingunghat," "Oomrawattee," "Dhollera," and "Dharwar," the first-mentioned being regarded as the finest of the Cottons of West India. It is impossible at present to determine whether these are forms of **G. herbaceum** or of **G. barbadense**, but they are probably forms of the latter species, if not hybrids.

In Cutch the Cotton is known as *Wagriah*. This is an annual, and attains a height of 2 feet. The flowers are yellow, and the capsules, instead of opening, remain shut, with only a small opening. The wool is called *Kalliah*.

In South India there are two varieties, *Oopum* and *Nadum*; the former is much the better quality and is an annual. The *Oopum* is known as *Vanparti*, Tam., *Putti*, Tel. It is possible that this may be the so-called **G. hirsutum** (Dharwar Cotton), which I regard as a hybrid between **G. herbaceum** and **G. barbadense**. It grows near the sea, where the coast has much of the character of an American upland. Specimens of the plant are required.

Section 3rd.– CHINA COTTON. 119

I have followed **Roxburgh** in giving this section, convinced that when he said that his notes and descriptions were the result of thiry years' study, he must have had good reasons for his view. This seems, however, to be the small abortive form met with on the hill tracts, and may have derived its name from being brought down from the hills bordering on Burma and China. Most importations from these tracts receive the name of Chin or China. I can discover nothing to justify its separation from the ordinary indigenous form, known as *Deshi kupas*. **Royle** seems to have distorted **Roxburgh's** idea, for in his *Culture of Cotton in India* he makes this out to be *Nankeen Cotton*, which **Roxburgh** has distinctly stated to be **G. religiosum**, and not a form of **G. herbaceum.**

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2nd.—Var. obtusifolium.

To this section belongs the small-leaved and bluntly-lobed form met with in Ceylon, to which **Roxburgh** gave the name of **G. obtusifolium. Royle** asks, what has often suggested itself to me, if this can be the original of the Indian forms of **G. herbaceum**, yielding all the preceding forms of truly Indian Cotton. While exploring the Burma-Manipur frontier I found this curious plant in a semi-wild condition. The Kukis, who are passing across Manipur to the north, year after year, carry out a most destructive mode of cultivation. A favourite spot in the heart of a primeval forest is selected. Trees that have taken perhaps centuries to grow are ruthlessly hewn down and, with the forest brushwood, burnt out. This is called *júming*. The soil is carelessly hoed and various crops are sown. After two or at most three harvests, the tribe migrate to another spot to renew their depredations. Many cultivated plants survive these visitations, and taking hold of the deserted spot continue to grow. *Júming* is also practised by the stationary hill tribes, a plot of land being cultivated for two seasons and deserted for 10 or 15 years. During the Boundary Commissioners' explorations, I repeatedly found fields of Wild Cotton or rather Cotton that had become wild. At first I thought I had discovered a truly wild species. The plants, as cultivated by the hill tribes on the Burmese frontier, are rarely more than 1 to 1½ feet in height; with small leaves, chiefly trilobed; and having yellow flowers, producing a tuft of poor cotton not larger than an ordinary bottle-cork.

I have departed so far from the arrangement in the *Flora of British India* as to suggest the removal of **var. hirsutum, var. religiosum** and **var. vitifolium** from **G. herbaceum**, and propose to place these forms under **G. barbadense.** The results of the present enquiry may disprove the propriety of this departure, but from present information, it seems likely to be supported.

I would here repeat what I have already stated, that not only the recent introductions of the so-called American Cottons, but probably also the so-called indigenous forms of this plant, are all purely exotic in their origin. This species I take to include **G. religiosum, G. vitifolium, G. acuminatum,** and probably **G. hirsutum.**

GREWIA.

121 **Grewia asiatica,** *Linn.*, TILIACEÆ.

Vern.—*Phálsa, pharoah*, HIND., SIND., PB.; *Shukri*, BENG.; *Phálase*, BOM.; *Phutiki* or *Putiki*, TEL.

A small, hazel-like tree, cultivated throughout India, said to be indigenous in the Salt Range, Poona, Oudh and Ceylon.

The fruit has a pleasant acrid taste, and is distilled, and a sherbet is made from it. An infusion of the leaves is regarded as demulcent.

The bark is used in rope-making, and much resembles the European bast fibres.

Grewia oppositifolia, *Roxb.* 122

Vern.—*Biúl, biúng, bahúl, bhengal, bhenwal, bhimal,* Hind.; *Dhamman, pharwa,* Pb.; *Pastuwanne,* Afg.; *Bieúl,* Simla.

A small tree, wild in the North-West Provinces, from the Jumna to Nepal; also frequently cultivated.

The bark gives a fibre frequently used in the Punjab for cordage and paper-making, but is apparently not durable. One tree will give about five seers of fibre, extracted by rotting for a month or more. The leaves are used to feed the cattle, and, being stripped off, nothing is thus lost.

G. orbiculata, *Rottle.* 123

Vern.—

A shrub of the Western Peninsula, nearly allied to the following species.

G. tiliæfolia, *Vahl.* 124

Vern.—*Pharsa, dhámin,* Hind.; *Dámana, karakana,* Bom.; *Khesla, kasul,* Gond; *Charachi, tharra,* Tel.; *Dhamono,* Uriya.

A moderate-sized tree of the Sub-Himalayan tract, from the Jumna to Nepal, ascending to 4,000 feet; also Central and South India.

The bark yields a good fibre, of which specimens were sent to the Paris Exhibition of 1878 from Berar. (*Gamble.*)

GUAZUMA.

Guazuma tomentosa, *Kunth.*, Sterculiaceæ. 125

The Bastard Cedar.

Vern.—*Thain puchie pattai,* Tam.; *Rudracks-hachettu,* Tel.

A tree, stellately hairy upon the young twigs. Perhaps only introduced into India, and probably a native of the West Indies. Frequently cultivated in the warmer parts of the plains and in Ceylon; distributed to Java and tropical America. **Dr. Royle** says it is "a South American tree, introduced into India, and largely cultivated at one time in the Madras Presidency, under the name of Bastard Cedar, as a fodder for cattle."

Bark used medicinally, being regarded as demulcent and slightly astringent. It yields a fibre, very little known.

Madras might perhaps supply specimens. Further information, especially as to its present use as a fodder, would be very acceptable.

HARDWICKIA.

Hardwickia binata, *Roxb.*, Leguminosæ. 126

Vern.—*Anjan,* Hind.; *Acha,* Tam.; *Nar yepi, yapa,* Tel.; *Kamrá, karachi,* Kan.; *Chota dundhera,* Gond.

A large, deciduous tree of the dry forests of South and Central India. The bark yields a strong and valuable fibre. (*Gamble.*)

HELIANTHUS.

127 **Helianthus annuus,** *Linn.*, COMPOSITÆ.

Vern.—*Shuriya-mukti,* BENG.; *Súryakánta,* BOM.

The common sunflower, largely cultivated in gardens in India.

The seeds yield an oil, and the twigs a fibre.

128 **H. tuberosus,** *Linn.*

The Jerusalem Artichoke, stated to be originally a native of Brazil, extensively cultivated as a vegetable in India.

The twigs yield a fibre.

HELICTERES.

129 **Helicteres Isora,** *Linn.*, STERCULIACEÆ.

Vern.—*Maror-phal, jonkaphal, kapasi, bhendu,* HIND.; *Antmorá,* BENG.; *Itah,* GODAVARI; *Aita,* GOND; *Kewan, kevana* (the fruit—*murudásenga*), BOM.; *Gubadarra, kavanchi,* TEL.; *Thungéche,* BURM.

A large, dense shrub of the tropical or Sub-Himalayan regions; from the Punjab to Bengal, South and Central India, and Burma.

The curious twisted carpels are used in medicine.

The fibre extracted from the bark is strong, white, and very useful for cordage, rough sacking, and canvas; seems likely to become a source of paper supply. Specimens were supplied by Berar to the Paris Exhibition.

HETEROPOGON.

031 **Heteropogon contortus,** *Linn.*, GRAMINEÆ.

THE SPEAR GRASS.

Vern.—*Yeddi,* TEL.

Grows on pasture grounds.

Used as a fibre.

HIBISCUS.

131 **Hibiscus Abelmoschus,** *Linn.*, MALVACEÆ.

THE MUSK MALLOW.

Syn.—ABELMOSCHUS MOSCHATUS, *Mœnch.*

Vern.—*Kasturi, kalla kasturi, bhenda,* HIND., BOM.; *Mushakdana, kala kasturi,* BENG.; *Hub-ul-mushk,* ARAB.; *Mushk-dana,* PERS.; *Mushk bhendi-ke-binj,* DEC.; *Kastura-benda, kathe kasturi,* TAM.; *Kasturi bendavittulu,* TEL.

A herbaceous bush, springing up with the rains and flowering in the cold season. Leaves, of various shapes; the lower, broad, ovate, cordate; the upper, narrow, hastate, very hairy. Common throughout the hotter parts of India, now met with in most other tropical countries.

The seeds are the Musk Mallow; warm, cordial and stomachic, aromatic and tonic. The whole plant is mucilaginous.

The stem yields a strong fibre.

Hibiscus cannabinus, *Linn.* 132

DECCANI HEMP; HEMP-LEAVED HIBISCUS.

Vern.—*Ambári, sankokla, patsar, suni,* DEC., HIND.; *Mesta-pát, nalki, pulua,* BENG.; *Garnikura,* SANS.; *Ambádá,* BOM.; *Palungú,* TAM.; *Goukura,* TEL.

A small, herbaceous shrub, with prickly stems, apparently wild east of the Northern Ghâts; largely cultivated, especially in North-West Provinces and Punjab, for its fibre. **Stewart** says it grows at Ghuzni, altitude 7,000 feet, and is not uncommon on the North-Western Himalaya, at 3,000 feet.

The fibre is used for cordage in the North-West Provinces and the Punjab. It is stronger, though not so good as *Sunn* (**Crotalaria juncea**). A rope experimented with by **Royle** bore 190 lbs.; while *Sunn* gave way with 150 lbs. In Sind this is considered the best fibre for nets and ropes, but it is rarely used for ropes. It is the chief fibre used in the manufacture of paper in the Dacca district. It is also used for this purpose in the Madras Presidency.

It is a very interesting fibre, and deserves more attention. It is sometimes met with as an adulterant of jute. The leaves are eaten as a pot-herb.

H. esculentus, *Linn.* 133

THE EDIBLE HIBISCUS; OCHRO of WEST INDIES; GOMBO, *Fr.*

Vern.—*Bhindi, ranturi,* HIND.; *Dhenras,* BENG.; *Bamya,* ARAB., PERS.; *Bhenda,* MAHR; *Vendi* (or *bhendi*), *vendaik-kay,* TAM.; *Venda-kaya,* TEL.

A herbaceous, annual bush, naturalised in all tropical countries; only met with in a cultivated state; probably a native of both India and the West Indies.

The unripe fruit is a favourite vegetable and medicine.

The bark yields a strong useful fibre, deserving attention. This fibre seems likely to deserve some attention as a source of paper.

H. ficulneus, *Linn.* 134

Syn.—H. STRICTUS, *Roxb.*; H. PROSTRATUS, *Roxb.*

Vern.—*Kapasiya,* N. W. P.; *Ban-dheras* (?), BENG.; *Parupu-benda, nella-benda,* TAM.

A native of the southern provinces; naturalised in the Punjab, and extending to Bengal, the Circars, and the Concan.

A small, herbaceous, and annual bush, which should be sown at the beginning of the rains. **Roxburgh** recommends that the seeds should be sown in a bed in May, and that the plants should be transplanted in rows nine inches apart.

Like most other **Malvaceæ**, this yields a valuable fibre. **Roxburgh** says, "In none have I found so large a quantity, equally beautiful, long, glossy, white, fine and strong as in this. To these properties may be added the luxuriant growth and habit of the plant, rendering it an object of every care and attention, at least until the real worth of the material is fairly ascertained." Like many of **Roxburgh's** valuable economic discoveries, this has remained for nearly a century without a single fact having been added or any progress made towards utilising the tons upon tons of valuable fibre lying useless on our waysides.

H. macrophyllus, *Roxb.* 135

An ever-green tree, a native of Eastern Bengal and the Eastern Peninsula. **Kurz** says its Burmese name is *Yet woon,* and that the liber yields a strong fibre. It is called *Kachia udal, Kasaya palla* in Bengal.

136 Hibiscus mutabilis.

THE CHANGEABLE HIBISCUS.

Vern.—*Shalapara*, HIND.; *Thulpudma*, BENG.; *Pudmu-charini*, SANS.; *Gul-i-ajáib* (STEWART).

This plant has its flowers white in the morning and red at night. It is a native of China, but is now largely cultivated in gardens from the Punjab to Burma and South India.

As with most of the members of the genus, the bark yields a strong fibre, of which that from the inner layer is soft and silky, that from the outer layer, hard and of a lead colour.

137 H. rosa-sinensis, *Linn.*

THE SHOE FLOWER, *Eng.*; KETMI DE COCHIN CHINE, *Fr.*

Vern.—*Jasut, jasum*, DEC., HIND.; *Juwa, joba, oru*, BENG.; *Jásavanda*, BOM.; *Shappattup-pu*, TAM.; *Java-pushpamu*, TEL.; *Angharæ-hindi*, ARAB.; *Angaræ-hindi*, PERS.

A favourite shrub in our Indian gardens, with single or double red yellow, or white flowers.

The flowers are used to give a polish to leather and shoes, and the bark contains a good fibre.

138 H. sabdariffa, *Linn.*

THE ROZELLE FIBRE.

Vern.—*Lal-ambari, patwa*, DEC., HIND.; *Mesta*, BENG.; *Lála ambádi*, SIND.; *Sivappu-kashuruk-kai*, TAM.; *Erra-gom-kaya*, TEL.; *Chinbaung*, BURM.

A small bush, cultivated in many parts of India on account of the succulent and acrid calyx.

The stems yield a good, strong. silky fibre. These are obtained by stripping the twigs, when in flower, by rotting. The succulent calyx yields the fruit made into Rozelle Jelly or Red Sorell Jelly. This fibre deserves more attention, especially, with reference to the paper supply.

139 H. tiliaceus, *Linn.*

Vern.—*Bola, chelwa*, BENG.; *Thinban*, BURM.

The coasts of India, Burma and Ceylon.

Yields a useful fibre, extensively used for cordage. It is said to gain in strength when tarred.

The fibre is readily separated from the green or unsteeped branches, the work of preparation being less tedious than applies to the other fibre-yielding plants of the genus. It appears to be well adapted for making ropes, mats and possibly paper. (*Cameron.*)

140 H. tricuspis, *Banks.*

Vern.—*Gurhul.*

A tree, introduced from the Society Isles, cultivated in gardens in Bengal and the North Western Provinces.

A strong bast-like fibre is obtained from the inner bark of the trunk and branches of this plant. The sample produced at Bangalore was steeped in water for 13 days. (*Cameron.*)

141 H. vitifolius, *Linn.*

Vern.—*Bun-kapas*, BENG.

A common, herbaceous bush, common in the tropical jungles and brushwoods, with large, yellow flowers having a deep rose purple eye at the base of the corolla. The leaves are often much perforated by insects. The bark yields a strong fibre.

HOLOSTEMMA.

Holostemma Rheedei, *Wall.*, ASCLEPIADEÆ. 142

Syn.—ASCLEPIAS ANUALARIS, *Roxb.*

Vern.—*Apúng*, CHUTIA NAGPUR; *Tulatule*, MAHR.; *Palagurgi*, TEL.

An extensive climber, met with in the forests of India ascending to altitude 5,000 feet, specially in Mysore, Bombay, Bengal, and Assam. Yields a fibre made into ropes.

ICHNOCARPUS.

Ichnocarpus frutescens, *Br.*, APOCYNACEÆ. 143

Syn.—ECHITES FRUTESCENS, *Roxb.* (*Fl. Ind., ii., 12.*)

Vern.—*Srama*, HIND.; *Dudhi, shyama-lutta*, BENG.; *Nalla-tiga*, TEL.

An extensive climber, met with on the Western Himalayas, from Sirmore to Nepal, altitude 1,000 to 2,000 feet; Upper Gangetic plain from Delhi to Bengal, Assam, Sylhet, Burma and Ceylon and South India.

The root is sometimes used as a substitute for Sarsaparilla. It has purgative and alterative properties. The bark yields a good fibre.

IMPERATA.

Imperata arundinacea, *Cyrill.*, GRAMINEÆ. 144

Vern.—*Shiro.*

Lower Himalaya, altitude 7,500 feet.

The fibre is used for the same purpose as that obtained from the *Munja* (**Saccharum munja,** *Roxb.*), namely, to prepare the sacrificial thread of the Hindus; and the leaves are used for thatching. (*Atkinson's Himalayan Districts.*)

From want of specimens I am unable scientifically to identify the grasses used for fibre, paper, &c., and am, therefore, compelled to compile from the writings of authors, in the hope that this sketch of the literature may help to bring in material for the solution of many doubtful questions of identity and synonymy. I am disposed to think that specimens of the above plant are, by some authors, placed in **Anthistiria arundinacea,** *Roxb.*, the *Ulu* Grass of the plains of India, which in some places clothes our railway embankments with a white woolly coat. It seems likely that they may prove to be synonymous.

INDIGOFERA.

Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ. 145

Vern.—*Bankati, kala sakena, sakna*, HIND.; *Khenti jund*, KAGHAN; *Kathi, gorkatri*, KASHMIR.

A small shrub of the Salt Range, from 2,500 to 5,000 feet, and outer Himalaya from the Jhelum to Nepal, ascending to 9,000 feet, but found as low as 1,200 feet on the Siwalik Hills.

The twigs are used for basket-work and twig bridges.

JUNCUS.

146 **Juncus effusus,** JUNCACEÆ.

Made into mats in Japan to which use **Royle** suggests that the Himalayan species, **Juncus glaucus**, might be put. In Europe **J. glaucus** was formerly used as a rush wick for candles and small oil lamps.

JUTE.

Jute, the fibre obtained from the stems of two plants belonging to the natural order **Tiliaceæ.** In the central and eastern parts of Bengal, **Corchorus capsularis,** *L.*, is chiefly cultivated, while in the neighbourhood of Calcutta **C. olitorius,** *L.*, is more frequent. Either or both together yield the jute of commerce.

References.—*Hem Chunder Kerr's Report on Jute and other Fibres in Bengal, 1877; Royle, Fibrous Plants, Ind. 240—252; Spons' Encycl., 940; Hook. Fl. Br. Ind. i. 397; Roxb. Fl. Ind. Ed. C. B. C. 429; Ainslie, Mat. Ind. ii. 387 Drury, U. Pl.*

Comm. and Vern. Names.—Jute, or Jew's Mallow, ENG.; *Jute, Mauve des juifs, cordetextile,* FR.; *Jute,* GER.; *Pat,* BENG. **Roxburgh** says that "the Bengalis call it jute," but **Royle** enters into an explanation of the origin of the word, which he makes out to be a corruption of *choti,* the name of a coarse cloth formerly made from this fibre. In ORISSA, this cloth was called *Jhut,* from which probably **Roxburgh** derived *Jute. Phetcwoon,* BURM.; *Patta, juta,* SANS. The plant when used as a pot-herb and dried as a medicine is in Bengal called *Nalita.* The fibre is *Pat* or *Koshta,* and is commercially *Jute.*

The cloth, which was once largely worn by the poorer classes, although now almost superseded by European goods, is called *Tat.* The coarser cloth made into bags and used for bedding was called *Choti.* The word *gunny* is perhaps derived from "*gun,*" a sail; or from "*goni,*" a South Indian name for coarse sackcloth, made originally, as it would appear, from *Sunn,* not from *Jute.*

Properties and Uses.

FIBRE. Stem. **147.**—It is extensively cultivated on account of the *fibre,* which is prepared by retting the stems in stagnant water.

Paper-making. Root. **148.**—The *root* is used as a fibre material in paper manufacture and the

149.—"Rejections" are largely used in paper manufacture, and for the coarse weft yarn of heavy bagging and sacking.

150.—"Cuttings" are used in paper manufacture, and in the manufacture of heavy bags and sacks.

POT-HERB. Leaves & Shoots. **151.**—The *leaves* and *tender shoots* are eaten as a pot-herb by the natives and are brought into the bázárs in large quantities in July and August: they are never eaten by Europeans. This is in all probability the same genus as that which yielded the ancient Greek pot-herb *Korkhorus*; hence the botanical generic name.

MEDICINE. (Tonic). Leaves. **152.**—An infusion of the dried leaves is used by the natives as a tonic; for this purpose the leaves are known as *nalita.*

ECONOMIC. The reeds. **153.**—The *reeds* or dried stems after the bark has been removed are used for a variety of purposes, and **Royle** says they are nearly as valuable to the cultivator as the fibre itself. They are straight, brittle, and readily combustible, and are largely consumed in the preparation of the charcoal used for gunpowder and in the manufacture of fireworks. They are also largely used as tinder in the preparation of native matches. They are formed into the large shady enclosures within which the betel-pepper leaf is cultivated; and from which was derived the idea of the modern orchid-house. One of the most useful purposes to which the jute cane is put, is the burning or charring of the hulls of native boats to destroy or expel the insects which may have commenced their depredations upon the timber. For this purpose the boat is raised to a certain height above the ground, and a few bundles of the jute canes are ignited below. Tied in bundles, they are also used for torch-light processions during the Lukhí·Pújah; Europeans use them as pea-stakes. An occasional crop of jute is said to improve a soil by exterminating the coarse grass which often takes a detrimental hold of a field.

General Account.

CULTIVATION AND PREPARATION.

In Bengal, jute is largely cultivated in the following districts: Pubna, Dinagepur, Rungpur, Mymensingh, Tipperah, Purneah, Julpiguri, Bogra, Dacca, Hugli, and the 24-Pergunnahs; moderately in Kúch Behár, Faridpur, Rajshahye, Backerganj, and in Goalpára in Assam.

Soil. Jute seems to be capable of cultivation on almost any kind of soil. It is least successful and almost unprofitable, however, upon laterite and open gravelly soils, and most productive upon a loamy soil, or rich clay and sand. The finest qualities are grown upon the higher lands (*suna*) in the vicinity of the homestead upon which the *aus* paddy, pulses, and tobacco generally form the rotation. The coarser and larger qualities are grown chiefly upon (*sali* lands) the churs or mud banks and islands formed by the rivers; and, indeed, the latter kinds may also be found upon submerged lands, and may be said to luxuriate in the salt-impregnated soil of the Sunderbans. **Mr. Hem Chunder Kerr** shows that in 1872-73 less than one million acres were under jute cultivation in Bengal, and that these spread over about 37 million acres of country. (This includes portions of the plains of Assam and Cachar where jute may be cultivated.) Should the demand be doubled, the production would absorb only one-eighteenth part of the available land.

Climate. A hot, damp climate, in which there is not too much actual rain, especially in the early part of the season, is the most advantageous; in exceptionally dry seasons one frequently finds crops standing through the cold season which the cultivator did not regard as worth cutting down.

Preparation of Soil. It may be stated that, when the crop is to be raised on low lands, where there is danger of early flooding, ploughing commences earlier than upon the higher lands. The more clay in the soil, the more frequently is it ploughed before sowing. The preparation thus commences in November or December, or not till February or March; the soil is generally ploughed from four to six times; the clods are broken and pulverised; and at the final ploughing the weeds are collected, dried, and burned.

Seed. No special attention is paid to the selection of good seeds, nor do the cultivators buy and sell their seeds. In the corner of the field a few plants are left to ripen into seed, and these are, next year, sown broadcast. The sowings, according to the position and nature of the soil, commence about the middle of March and extend to the end of June.

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Harvest. The time for reaping the crop depends entirely upon the date of sowing; the season commences, with the earliest crop, about the end of June, and extends to the beginning of October.

The crop is considered in season whenever the flowers appear, and past season, with the fruits. The fibre from plants that have not flowered is weaker than from those in fruit; the latter is coarser, and wanting in gloss, though stronger. It is late reaping that is chiefly accountable for the coarse fibre found in the market.

Crop. The average crop of fibre per bígha is a little over 5 maunds, but the yield varies considerably, being as high as 10 or 12 in some districts and as low as 1—2 or 3 in others, and it is also very dependent upon the season.

Separation of Fibre by Retting. At present, as practised by the natives, the fibre is separated from the stems by a process of retting in pools of stagnant water. In some districts the crop is stacked in bundles for two or three days, to give time for the decay of the leaves, which are said to discolouur the fibre in the retting process; in others the bundles are carried off and at once thrown into the water. There is some ground for thinking that, if the drying of the leaves by stacking does not prevent the discoloration of the fibre, the fibre itself is likely to be benefited by the process, since it is found to separate more readily from the stems, and is thereby saved from the danger of rotting from over-maceration. In some districts the bundles of jute stems are submerged in rivers, but the common practice seems to be in favour of tanks or road-side stagnant pools. The period of retting depends upon the nature of the water, the kind of fibre, and condition of the atmosphere. It varies from two to twenty-five days. The operator has therefore to visit the tank daily, and ascertain, by means of his nail, if the fibre has begun to separate from the stem. This period must not be exceeded, otherwise the fibre becomes rotten and almost useless for commercial purposes. The bundles are made to sink in the water by placing on the top of them sods and mud. When the proper stage has been reached, the retting is rapidly completed. The cultivator, standing up to the waist in the fœtid water, proceeds "to remove small portions of the bark from the ends next the roots, and, grasping them together, he strips off the whole with a little management from end to end without breaking either stem or fibre. Having brought a certain quantity into this half-prepared state, he next proceeds to wash off; this is done by taking a large handful; swinging it round his head, he dashes it rapidly against the surface of the water and draws it towards him, so as to wash off the impurities; then, with a dexterous throw, he spreads it out on the surface of the water and carefully picks off all remaining black spots. It is now wrung out so as to remove as much water as possible, and then hung up on lines prepared on the spot, to dry in the sun."—(*Mr. Henley, in Royle's Fibrous Plants, 248.*)

Extraction of Fibre by means of Machinery. There is little doubt that the retting weakens the fibre very considerably. Could a simple contrivance be invented for the purpose of extracting the dry jute fibre, and if it were so cheap that it might be procured even by the poorer cultivators, new and at present undreamt-of industries might spring into existence. It is to be feared, however, that machinery will, for some time to come, be beyond the means of the cultivator, and that the principal improvement may be looked for in the application of natural, mineral, or chemical appliances somewhat on the lines of the Ekman Patent process for the separation of fibres. A machine deserves attention which is known as Garwood's patent: it does no more than separate the bark from the stem, and the fresher the stem, the more easily is the bark se-

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parated. **Mr. W. Cogswell**, who is an undoubted authority on the question of jute, expressed in December 1881 his opinion that a softer fibre was obtained by the old process (*vide* A. H. Society Proceedings, December 1881.)

COMMERCIAL VARIETIES.

There are several well-known commercial VARIETIES of jute fibre, of which the following, arranged in the order of their commercial importance, are the more important: *Uttariyá, Deswál, Desi, Deorá, Serajganji, Naraínganji, Bákrabadi, Bhatial, Karimganji, Mirganji,* and *Jungipuri.* For convenience of reference we shall discuss these in alphabetical order.

1. **Bakrabadi.**—A beautiful soft fibre, one of the finest qualities from the Dacca district, being raised on the *churs* of the Megna river.
2. **Bhatial.**—A coarse strong fibre, chiefly exported to Europe for rope manufacture. It is grown on *churs* and obtained from the south of Narainganj; hence the name, from *bhati*, tidal.
3. **Deora** (in commerce *Dowrah*).—A strong useful fibre, used chiefly in rope manufacture. It derives its name from a village near Faridpur, where there was formerly a large mart for this variety of jute. The name is given to all the jute from Backerganj and Faridpur.
4. **Desi** (in commerce *Daissee*).—This is a useful and good fibre, largely used for gunnies; it is long, soft, and fine, but it has a bad colour and is pronounced "fuzzy." It is produced in the districts around Calcutta, such as Hugli, Burdwan, Jessore, and the 24-Pergunnahs.
5. **Deswal.**—A fine bright-coloured fibre, much admired on account of its strength. After the *Uttariya* this is, commercially, the most important variety. It comes from the neighbourhood of Serajganj, and is said to consist of two kinds or sub-varieties:—
   (*a*) Bilan Deswal, or fibre from the crop grown over *bheels* or marshes.
   (*b*) Charna Deswal, or fibre from the crop grown on *churs*.
6. **Jangipuri.**—A poor fibre, short, weak, and more suited for paper manufacture than for spinning. It comes from the Pubna district.
7. **Karimgunji.**—A fairly good fibre, very long and of good colour. It comes from the Mymensingh district, taking its name from a small village.
8. **Mirgunji.**—Generally an inferior fibre; the worst kind coming from Mirganj, a village on the Teesta. The fibre generally comes from the Rungpore district.
9. **Naraingunji** (in commerce *Naraingunge*).—This is an excellent fibre for spinning, being long and soft. It comes from the Dacca district, and is exported to Calcutta from the Narainganj marts.
10. **Serajganji** (in commerce *Serajgunge*).—Produced in the Pubna and Mymensingh districts.
11. **Uttariya.**—This is regarded as the finest variety; it is long, has a brilliant colour, is strong and easily spun, but it is not up to *Desi* or *Deswal* in softness. It comes into the market in November. It receives its name on account of its coming from the northern portions of Serajganj and that neighbourhood. The following are the localities from which it is obtained: Rungpore, Goalpara, Bogra, parts of Mymensingh, Kuch Behár, and Julpiguri.

These 11 varieties, and other minor examples, are, in commerce, generally grouped under four leading qualities represented by the *Serajganj, Naraínganj, Desi* and *Deora*; and these again are classed as "Fine," "Medium" and "Common" according to the qualities of the fibres.

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PRICE OF CULTIVATION.

No trustworthy figures are available of the prime cost to the cultivators of raising and extracting a maund of jute fibre. But the following figures which have been kindly furnished by a private firm lead to the rates paid to the growers. Jute landed in Calcutta cost as follows per maund in the last four years:—

Qualities.		1879-80.			1880-81.			1881-82.			1882-83.		
		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Narainganj.	Fine	5	2	9	5	0	3	4	15	10	3	7	6
	Medium	4	9	6	4	6	9	4	3	4	2	15	2
	Common	4	0	9	3	13	7	3	10	4	2	7	6
Serajganj	Fine	5	4	0	5	2	0	5	1	0	3	9	0
	Medium	4	11	0	4	8	0	4	4	0	3	1	0
	Common	4	2	0	3	15	0	3	12	0	2	9	0

The charges per maund incurred from the time the jute is purchased from the producer to the time it is landed in Calcutta are as follows approximately:—

	Narainganj.			Serajganj.		
	Rs.	A.	P.	Rs.	A.	P.
Freight to Calcutta	0	8	0	0	8	0
Drumming, shipping, &c.	0	2	0	0	2	0
Aratdari	0	2	0	0	2	0
Bepari's profit	0	5	0	0	5	0
TOTAL	1	1	0	1	1	0

Deducting the charges just shown from the cost of the jute landed in Calcutta, will give the rates paid to the grower, thus:—

Qualities.		1879-80.			1880-81.			1881-82.			1882-83.		
		Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Narainganj.	Fine	4	1	9	3	15	3	3	14	10	2	6	6
	Medium	3	8	6	3	5	9	3	2	4	1	14	2
	Common	2	15	9	2	12	9	2	9	4	1	6	6
Serajganj	Fine	4	3	0	4	1	0	4	0	0	2	8	0
	Medium	3	10	0	3	7	0	3	3	0	2	0	0
	Common	3	1	0	2	14	0	2	11	0	1	8	0

The prime cost to the cultivators must be something lower than the figures shown in this last statement; and assuming that the data furnished are near the truth, if not absolutely correct, they lead to the following important inferences, *viz.*, (*a*) that the price of jute has declined considerably during the last four years, and (*b*) that while the profits of the middle men have not varied, those of the growers have fallen proportionately with the fall of prices in Calcutta. If the prices which merchants can afford to pay to the growers do not rise, it is doubtful whether the latter will continue to cultivate jute in any considerable quantities. At present the two classes of the fibre known as Narainganji. and Serajganji form a very large proportion of the jute imported into Calcutta, thus:—

Classes.	1879-80.	1880-81.	1881-82.	1882-83.
	Mds.	Mds.	Mds.	Mds.
Narainganj	25,00,000	32,00,00	35,00,000	45,00,000
Serajganj	26,00,000	28,00,00	30,00,000	35,00,000
TOTAL IMPORTS INTO CALCUTTA				

HISTORY OF THE JUTE INDUSTRY.

The HISTORY OF THE JUTE INDUSTRY is exceedingly interesting, and intimately associated with the British rule in India. There can be no doubt that jute was known to the people of India from remote periods, but the confusion which existed down to the present century in the words *sunn*, *pat* or *patta*, *bhanga* and *hemp*, applied to certain Indian fibres, renders it difficult to determine the plants referred to by the ancient writers. The probability is that *sunn hemp* (the fibre of **Crotalaria juncea**) was better known to the ancient Hindús than *jute*, and that in still more ancient times the true hemp (**Cannabis sativa**) was known to them, if not brought to India by their invading and conquering ancestors. It may be assumed that *sunni*, *patta*, and *bhangi* were synonymous and generic terms for fibre and coarse cloth, without regard to the plant from which the fibre was obtained. About the beginning of the present century, however, the word *pat* became fixed and associated with the fibre of **Corchorus olitorius** and **capsularis.** Prior to that date the Government returns of the exportations from India mention *hemp fibre;* this must have either been *sunn* or *jute*, since true hemp fibre has not been cultivated for centuries, and modern experiments have shown that it is not capable of cultivation as a fibre plant in the plains of India.

With the advance of civilization came an increased demand for cloth, at first as a luxury, and latterly as a necessity. Jute probably met this demand; and, indeed, the poorer people, little more than half a century ago, were largely clad in jute cloth of home manufacture, such as, at the present day, is used by the aboriginal tribes. The increased facilities for the importation of cheap European piece-goods checked, however, the development of the indigenous industry; but with the rapid progress in every other branch of industry, there opened up a foreign trade in jute which the agriculturalist found remunerative. The resources of the rich plains of India, Burma, and China, and latterly America, Australia and Egypt, were by the British mercantile fleet made available for the supply of grain. Bags were required for this trade, and thousands of rough gunnies were greedily bought up. The high price obtained was a powerful incentive to increased activity, and thus the gunny-bag trade rapidly became a

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recognised part of the Bengal peasant's work. By and by, however, European machinery began to compete with manual labour, and in due time it gained the day. Jute was exported to Europe for cordage, and ultimately for the manufacture of the bags required in the grain trade. The first commercial mention of the word "jute" is in the customs returns of the exports for 1828, when 364 cwt. were sent to Europe. Soon the agriculturist found that his time would be more profitably spent in preparing an extra quantity of fibre, than in manufacturing bags to compete with steam and mechanical appliances; the preparation of fibre speedily outstripped the demand for home manufacture, and a large export trade was established in raw jute to feed the Scotch mills. Thus transferred from its original home, the gunny trade took a new start in Dundee, and down to the year 1854 little or no effort was made to improve the Indian manufacture by the application of European machinery. In that year, however, the "Ishera Yarn Mills Company" was established at Ishera near Serampore by Mr. George Ackland, a large owner of coffee plantations in Ceylon and non-official member of the Legislative Council of that Island: these mills were afterwards called the "Ishera Company, Limited," and are now known as the "Wellington Mills." Three years later (1857) the "Borneo Company, Limited," which was a company originally established to exploit the Island of Borneo, founded the mills now known as the "Baranagore Jute Mills." In 1863-64 the Gouripore Jute Factory came into existence. Factories sprang up rapidly in every direction around Calcutta. In the Trade Returns for 1869-70 the exportation of manufactured jute was 6,441,863 gunny bags manufactured by power and hand looms, and brought into competition with the Dundee bags. This trade developed steadily, and in 1879-80, ten years later, over 55,908,000 gunnies were exported from India. The relative importance of the export trade in raw jute, as compared with the exports in manufactured jute of all kinds, may be seen by a careful examination of the tables here given in the succeeding pages, but the result may be summarised by saying that in 1881-82 the exports of raw jute amounted to £5,030,302, whereas for the same year the entire exports from India of power and hand-loom jute manufactures amounted to only £1,097,250. Thus, it would seem that even with 22 large European factories at work in India, and the numerous hand-looms scattered over the entire country, her foreign jute interests were four times as valuable to India as her home manufactures. A comparison between the exports of Indian "power-loom" as compared with "hand-loom" manufactures will still further show the extent to which the jute manufactures have passed out of the hands of the Indian peasants who alone, little more than 40 years ago, met the demand for gunny bags. This is seen very clearly when the above figures for 1881-82 are compared with the exports of 1850-51. At that time the value of the gunnies exported was greater than that of the raw jute,—the former being £215,978, the latter, £197,071. There were no European factories in India in 1850, so that the market was supplied by the Indian peasant's hand-loom. Steadily the exports increased, the demand for gunnies calling into existence the Dundee mills, and soon after the Indian factories. Nothing could demonstrate the development of the jute trade more than a careful examination of the exports of raw jute and manufactured jute from 1860 to 1880. During that period 22 factories, larger than the average jute factories of Europe, have come into existence, and have gradually commenced to pour their manufactures into the market, largely, if not entirely, meeting the home (Indian) consumption. While this has been taking place, the foreign exports of raw jute have uninterruptedly continued to increase, each year exceeding the preceding, apparently quite unaffected by the powerful Indian competition to the Dundee and other foreign manufactures.

RAW JUTE.

EXPORTATION AND HOME CONSUMPTION.

The following abstract of the EXPORTS OF RAW JUTE FROM CALCUTTA will be found exceedingly interesting, as showing the steady and constant increase and development of the jute trade. The mean exportations for each period of five years, during the 50 years commencing with 1828, will be seen to have, in round numbers, almost doubled those of the preceding period. It should be carefully noted, however, that these figures represent but a portion of the jute industry,—namely, the exports. The home consumption is generally about twice as valuable as the (foreign) exports. (See page 48.)

Up to	Average of five years, in cwts.
1832-33	11,800
1837-38	67,483
1842-43	117,047
1847-48	234,055
1852-53	439,850
1857-58	710,826
1862-63	969,724
1867-68	2,628,110
1872-73	4,858,162
1877-78	5,362,267

The exportations from Bengal of RAW JUTE during the last published year (1881-82) were 7,510,081 cwts., so that the average for the five years ending 1882-83 must be considerably over 6,000,000 cwts. The rapid, yet constant, increase in the jute trade, which the above figures show, from 364 cwts. in 1828 to 7,510,081 cwts. in 1883, representing an increase in value from Rs. 620 to Rs. 5,03,03,023 in the short period of 55 years, speaks volumes for the noble fleet of merchant vessels trading with our Indian ports. **Mr. Hem Chunder Kerr**, in his valuable *Report on the Cultivation of and Trade in Jute in Bengal*, has, as appears from the figures quoted, laid too much stress upon the Russian war in 1854-55 as a cause of the development of the jute trade of India. It doubtless was a cause, but an insignificant one as compared with the internal administrative reforms and with the engineering enterprise which, by railway, road, and canal, brought the resources of India into the field of European commerce.

Exportation of RAW JUTE *from all India from 1877 to 1882.*

Years.	Quantity in cwts.	Value in rupees.
1877-78 . . .	5,450,276	3,51,81,137
1878-79 . . .	6,021,382	3,80,04,263
1879-80 . . .	6,680,670	4,37,00,325
1880-81 . . .	5,809,815	3,93,40,296
1881-82 . . .	7,510,314	5,03,03,023

JUTE.

The figures given for the successive years show that the exportation of jute steadily increased from 1,092,668 cwts. in 1860-61, to 3,754,083 cwts. in 1870-71; in 1871-72, it suddenly rose to 6,133,813 cwts., and during the past ten years it has had an average of about 5,500,000 cwts.

The following analysis of the exports of raw jute from India for the year 1881-82, taken from the Annual Statement of Trade and Navigation, shows the presidency from which it was exported and the chief countries to which it was consigned:—

Presidency from which exported.	Quantity in cwts.	Value in rupees.	Country to which exported.	Quantity in cwts.	Value in rupees.
Bengal .	7,510,081	5,03,01,752	United Kingdom	5,627,534	4,03,09,974
Bombay .	195	975	Austria . .	105,540	7,75,725
Madras .	38	297	France . .	141,181	9,90,031
			Italy . .	82,308	6,32,384
			Germany . .	33,804	2,27,640
			Egypt . .	34,957	2,34,670
			United States .	1,431,014	67,57,183
			Other countries .	53,976	3,75,416
TOTAL .	7,510,314	5,03,03,023	TOTAL .	7,510,314	5,03,03,023

Indian commercial men calculate that on an average Scotland consumes over 18,400 bales (73,600 cwts.) a week. Of these, Messrs. Cox Brothers consume 2,200; Messrs. Gilroy & Sons, 750; Messrs. Malcolm, Ogilvie, & Co., 650; Mr. John Sharp, 700. In England the weekly consumption is over 1,860 bales, the largest consumers being the Barrow Company, 600. In Ireland the total weekly consumption is about 730 bales, the largest firm consuming under 300 bales a week. Thus Great Britain requires over 21,000 bales or 84,000 cwts. a week, or 4,200,000 cwts. a year to keep her existing jute factories employed. These figures when compared with the hand-loom consumption in Bengal shows how completely the gunny trade has passed out of the hands of the Indian peasant. The entire hand-loom consumption in Bengal is given as 2,23,000 maunds a year, but allowing 50,000 maunds more to cover imperfections, this would give an annual consumption of 195,000 cwts. The Scotch power-looms alone consume 73,600 cwts. a week, or 3,710,000 cwts. a year.

France requires 4,000 bales a week, its largest consumer, Saint Freres, requiring 700 bales; Germany requires 2,170 a week, of which the Brunswick Jute Spinning Company consume 770 bales; Belgium requires 845 bales a week; Austria, 580; Spain, 250; Holland, 400; Norway, 100. Taking annual figures for the whole of Europe it is found that Great Britain and the Continent of Europe require 1,800,000 bales a year, or 6,428,580 cwts. Of course, these figures must vary considerably from year to year, but they may be relied on as approximately and relatively correct. It may be here stated that as merchants adopt the calendar year and Government the financial year, from April to March, considerable difficulty has been experienced in comparing the Government Statistical Tables of Exports with those kindly supplied to me by one or two well known jute firms in Calcutta.

Comparing with the above figures the 22 Indian factories, which on an average each consume 500 bales per week, or 600,000 bales a year, equivalent to 2,142,948 cwts., it appears that to keep the existing factories of Europe and India working, about 8,571,428 cwts. of raw jute are required; and adding to this amount the quantity annually consumed by America, Australia and other foreign countries, *viz.*, 600,000 bales, or 2,142,498 cwts., not included in the above calculation, the annual consumption cannot be much under 3,000,000 bales, or 10,714,476 cwts. In his report on the jute trade in Bengal, **Mr. Hem Chunder Kerr** gives the amount raised in 1872 as 13,568,485 maunds. He further states that 5 maunds per bigha is the average yield, and that the above quantity raised in 1872 was obtained from 925,899 acres.

Looking at the exportation of raw jute, of manufactured jute and the home (Indian) consumption known to our commercial men, the statement that the jute trade is represented at the present date by an annual consumption of over 10,000,000 cwts. of raw jute does not seem to be far from correct. This roughly represents an annual source of wealth equal to about 8 millions of pounds sterling as compared to the exports in 1828 of £62.

THE MANUFACTURE OF JUTE, AND THEIR EXPORTATION FROM INDIA.

In the vicinity of Calcutta, since 1864, 19 jute factories have sprung up in rapid succession. Of these, 12 are limited companies, with a nominal capital of Rs. 1,81,33,800; the others are private factories. These 19 factories have 5,464 looms and 87,071 spindles, and they give employment to 21,089 men, 9,519 women, 4,254 young persons, and 2,719 children. In Bombay there is one limited jute company with a nominal capital of Rs. 6,00,000, and giving employment to about 590 persons. In Madras there is a private jute company, employing about 878 persons. Thus up to the present date there are in all India 22 jute factories with 5,655 looms, 90,755 spindles, employing 40,551 persons. They are almost exclusively employed in the gunny bag or cloth trade, three only doing a small business in cordage or other manufactures. New mills and extensions are in progress which will probably increase the number of looms to over 7,000.

In 1879 there were in England 12 factories, in Scotland 99, in Ireland 6; in all 117 factories, with 212,676 single and 7,492 double spindles, and 11,288 looms, giving employment in all to 36,354 persons. In India there are only 22 factories, but these employ 40,551 persons.

It is difficult to make a reliable comparison without the details of every individual factory. Judging from the published statistics of jute factories in Scotland during the year 1879, and comparing 22 of these with the Indian factories for the same year, we may, however, conclude that the Indian mill workman was inferior to the Scotch workman in the ratio of 3 to 7. That is to say, it requires 7 persons to work one loom in an Indian factory, against 3 workmen in a Scotch factory. This conclusion is arrived at by dividing the total number of persons employed in a factory by the number of its looms and obtaining the average for all Scotch factories and the average for all Indian factories. Of course this calculation is open to the error of the Indian and English factories not manufacturing the same cloth; but relatively it may be relied upon.

Exportation of GUNNY BAGS *during the past five years.*

YEARS.	POWER-LOOM.		HAND-LOOM.	
	Quantity.	Value.	Quantity.	Value.
	No.	Rs.	No.	Rs.
1877-78	25,695,574	71,37,022	710,965	1,59,664
1878-79	43,393,267	99,71,859	1,960,777	4,55,032
1879-80	53,989,661	1,09,13,660	1,919,070	4,08,119
1880-81	51,004,030	1,04,97,636	1,382,197	2,68,553
1881-82	41,156,766	1,05,12,437	916,053	3,28,375

The following analysis of the exports of GUNNY BAGS for the year 1881-82 shows the presidencies where they were manufactured and the countries to which they were exported:—

POWER-LOOM.					
Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	No.	Rs.		No.	Rs.
Bengal .	40,409,325	1,03,10,851	Australia . .	15,917,959	58,71,690
Bombay .	697,952	1,90,339	China: Hong-Kong	9,948,610	12,81,022
Sindh .	12,068	2,839	Straits . .	6,408,812	15,02,609
Madras .	28,315	6,736	United States .	5,949,500	8,77,634
British Burma (probably re-exports).	9,106	1,672	Natal .	753,057	2,53,154
			Cape of Good Hope.	519,150	2,19,763
			Persia . .	393,419	1,03,792
			Egypt . .	365,400	1,60,403
			Ceylon . .	144,207	40,951
			United Kingdom .	106,606	29,604
			Other countries .	650,046	1,71,815
TOTAL .	41,156,766	1,05,12,437	TOTAL .	41,156,766	1,05,12,437

HAND-LOOM.					
Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	No.	Rs.		No.	Rs.
Bengal . .	905,775	3,25,816	Australia . .	520,175	2,44,369
Bombay . .	4,500	1,575	Cape of Good Hope.	199,900	44,630
Madras . .	5,510	804	United States .	150,000	28,250
Sindh . .	268	180	South America .	20,000	5,400
			Mauritius . .	13,000	2,515
			Other countries .	12,978	3,211
TOTAL .	916,053	3,28,375	TOTAL .	916,053	3,28,375

JUTE.

The following tables show the exportations of GUNNY CLOTH during the past five years, and the presidencies in which the cloth was manufactured and the countries to which it was exported during the year 1881-82:—

YEARS.	POWER-LOOM.		HAND-LOOM.	
	Quantity.	Value.	Quantity.	Value.
	Yards.	Rs.	Yards.	Rs.
1877-78	2,964,069	3,55,190	1,490	910
1878-79	4,536,331	5,14,655	134,360	10,991
1879-80	5,210,246	6,06,543	2,760	370
1880-81	4,214,964	5,05,617	11,000	1,000
1881-82	988,796	1,19,455	...	...

Analysis of Exports of GUNNY CLOTH *(power-loom) from India for the year 1881-82.*

Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	Yards.	Rs.		Yards.	Rs.
Bengal .	975,111	1,16,825	China: Hong-Kong	505,000	58,474
Bombay .	12,485	2,030	United States .	366,200	44,992
Madras .	1,200	600	Ceylon . . .	44,062	6,234
			Persia . . .	41,900	5,707
			Italy . . .	11,459	1,810
			Australia . .	11,050	1,291
			Other countries .	9,125	947
TOTAL .	988,796	1,19,455	TOTAL .	988,796	1,19,455

The exportation of ROPE AND TWINE during the past five years may be seen from the following table; and the analysis of that for the year 1881-82 shows the presidencies from which, and the countries to which, they were exported:—

Years.	Quantity in cwts.	Value in rupees.
1877-78	4,428	54,431
1878-79	2,768	28,298
1879-80	2,053	16,754
1880-81	2,229	27,518
1881-82	1,372	12,194

JUTE.

Analysis of Exports of ROPE AND TWINE *from India for the year 1881-82.*

Presidency from which exported.	Quantity in cwts.	Value in rupees.	Country to which exported.	Quantity in cwts.	Value in rupees.
Bengal	1,370	12,129	United States	718	2,781
Bombay	1	40	Straits	491	6,907
Madras	...	5	Australia	158	2,411
British Burma	1	20	Other countries	5	95
TOTAL	1,372	12,194	TOTAL	1,372	12,194

LOCAL CONSUMPTION.

It should be carefully observed that the preceding tables show only the exportation, properly so called, of bales of prepared gunny bags, gunny cloth, or jute rope as such. They do not include the thousands of gunnies, &c., which annually leave the ports of India containing grain or other produce, nor those used for home purposes or sent to other parts of India. The above figures do not, therefore, show the whole out-turn of gunnies annually manufactured in India. In fact, from January to December 1882, 119,042,771 gunnies were actually made by power-looms, of which only 41,523,607 were exported; so that the exports were barely one-third of the number actually manufactured. The following table will show the relations of the home consumption to the exports more clearly:—

Statement of Home Consumption and Exports of GUNNIES *from 1st January to 31st December 1882.*

Burma	13,312,306	
Straits	9,153,233	
Bombay and Persian Gulf	20,001,308	
Madras and Malabar	1,064,848	
Coromandel Coast	3,609,950	
Ceylon	177,777	
Up-country by rail	11,351,000	
Used for other exports from Calcutta	11,848,742	
Total of Home Consumption		77,519,164
Australia	11,372,387	
New Zealand	5,060,160	
Cape of Good Hope	706,308	
Mauritius	119,078	
Egypt	691,078	
America	20,554,251	
Hongkong (not Hessians)	413,700	
Britain	516,417	
Europe	90,231	
Total of Exports		41,523,607
Grand Total of Home Consumption and Exports		119,042,771

JUTE.

CLASSIFICATION OF THE JUTE MANUFACTURES.

The manufactures of *jute* or *pat* may be referred to three primary sections:

I. CLOTH of different qualities ranging from substitutes for silk to shirtings, curtains, carpets, and gunnies.
II. PAPER chiefly prepared from the "rejections" and "cuttings."
III. CORDAGE from the coarser and stronger qualities.

These three sections may each be divided into a number of sub-divisions, which for convenience may be arranged in two leading groups, *viz*., native and indigenous manufactures, "hand-loom" and European or "power-loom" manufactures, whether made in Europe or in India. We shall first enumerate the indigenous manufactures since these bear on the history of the industry.

INDIGENOUS MANUFACTURES.

Indigenous Cloth.—Every homestead in Bengal has suspended from a beam in the roof of the verandah a few bundles of jute fibre, which, while talking pleasantly with a neighbour, the peasant twists, with various kinds of spindles, into twine of varying thickness, intended for domestic purposes or for the yarn from which the women prepare the home-spun cloth or gunny bags. **Babu Ramcomal Sen**, in the Transactions of the Agri-Horticultural Society, describes three different modes of preparing twine or yarn in Bengal. The first is by means of a reel, called a *dhera,* the second by the *takur,* and the third by the *ghurgurra.* The first is said to be used in making yarn for gunnies, the second for fine yarns intended for cloth, and the third for twine to be afterwards made into ropes.

The natives weave three distinct kinds of jute cloth:—

1st, Thick cloth used for making gunny bags. Of this there are three qualities, the best being known as *amrabati.* These correspond to the three qualities of hand-loom gunnies in commerce.

2nd, Fine cloth.—This is generally known by the name of *mekli dhokrá,* and is chiefly used as a cloth to sleep on; it is often beautifully striped blue or red.

3rd, Coarse cloth.—This is largely used for making the sails of country boats (*gun*), and also for bags to hold large seeds or fruits.

The following are the principal districts in Bengal where indigenous jute manufactures (hand-looms) may be said to exist to any considerable extent:—Hugli, consuming about 1,20,000 maunds of jute a year; Dacca, 90,000; Rungpore, 50,000; Moorshedabad, 38,000; Malda, 25,000; Julpiguri, Pubna, &c., smaller quantities.

EUROPEAN MANUFACTURES.

Cloth made in Factories.—Jute is now largely used in the manufacture of carpets, curtains, shirtings, and is also mixed with silk or used for imitating silk fabrics. It has been applied extensively as a substitute for hemp: for this purpose the fibres are rendered soft and flexible by being sprinkled with water and oil, in the proportion of 20 tons of water and 2½ tons of train oil to 100 tons of jute. Sprinkled with this the jute is left for from 24 to 48 hours, when after being squeezed by rollers and heckled, the fibres become beautifully soft and minutely isolated, and thereby suited for a number of purposes unknown a few years ago.

The history of this trade is exceedingly interesting. In the year 1820 the fibre was first experimented with, but the result was unfavourable; and, in consequence, brokers were required to certify that sales of hemp and other fibres were not adulterated with jute. In 1832 an enterprising Dundee manufacturer experimented once more on the fibre, and the result was that he was able to show that it might be used as a substitute for hemp. From that date jute gained rapidly in public favour. Jute is one of those fabrics capable of the most minute separation or sub-division, but it is only within the past few years that it has been extensively used in the finer textile industries. For a long time the difficulty of bleaching seemed insurmountable, and the trouble experienced in dyeing the fibre appeared likely to nullify every effort to utilise it. All these stumbling-blocks have, however, been removed, and there cannot be a doubt that, but for the want of durability, jute would soon rank as the most valuable of all fibres. Its perishable nature, however, is fatal to its obtaining a position much higher than it has already attained, and probably admixture of jute in certain articles, such as sail-cloths, must sooner or later be viewed as a criminal offence. The manufactures which occupy the attention of our Indian companies are almost exclusively the various forms of gunnies.

KYDIA.

154 **Kydia calycina,** *Roxb.*, MALVACEÆ.

Vern.—*Pola, púla, puli patha, potari,* HIND.; *Barranga, bhoti,* C. P.; *Kubinde,* NEPAL; *Váranga, várangada,* BOM.; *Kopasia,* URIYA; *Potri, pedda kunji,* TEL.; *Dwabot,* BURM.

A small tree common in the forests of all parts of India and Burma, except the arid region.

The inner bark yields a fibre.

LAPORTEA.

155 **Laportea crenulata,** *Gandich.*, URTICACEÆ.

Vern.—*Chorpatta, surat,* BENG.; *Moringi,* NEPAL; *Mealum-ma,* LEPCHA; *Mausa,* CINGH.; *Petya-kyi,* BURM.

A tree of Sikkim, Assam, Eastern Bengal, the West Coast, Ceylon, and Burma; with glossy, broad leaves and minute, stinging hairs.

It yields a good fibre, which can be made into ropes and coarse cloth.

LASIOSIPHON.

156 **Lasiosiphon eriocephalus,** *Decne.*

Vern.—*Naha,* CINGH.

A large shrub of Bengal and South India.

The bark yields a fibre.

LEPTADENIA.

157 **Leptadenia Spartium,** *Wight,* ASCLEPIADEÆ.

Syn.—L. JACQUEMONTIANA, *Decne.*

A small bush of the Himalaya on the Jumna, at Simla, &c. It receives its name **Spartium** most probably on account of its being used for ropes, baskets, &c., as Esparto Grass formerly was.

Yields an excellent fibre, used in Sindh. **Dr. Royle** says it is used with **Periploca aphylla,** *Decaisne,* to form the ropes and bands used for wells, the combined fibres not being much affected by moisture.

LICUALA.

Licuala peltata, *Roxb.*, PALMÆ. 158

The leaves of this palm are used in Assam for umbrellas, and in the Andamans for thatching. In Chittagong it forms a great part of the undergrowth in some forests, notably the Kasalong Reserve, and its leaves, under the name of *Kuruchipat*, are universally used in the Hill tracts for thatching, and when grass is scarce are largely exported to the plains.

LINUM.

Linum usitatissimum, *Linn.*, LINEÆ. 159

FLAX, LINEN.

Vern.—*Alsi*, HIND.; *Tisi*, *masina*, BENG.; *Alási*, *javasa*, BOM.; *Alshi-virai*, TAM.; *Atasi*, TEL.

Largely cultivated in Bengal and the North-West Provinces for its seeds; very rarely on account of its fibre, which in India is very inferior to Egyptian flax.

LYGEUM.

Lygeum Spartum, GRAMINEÆ. 160

As the specific name implies, this grass is largely used for paper-making under the name of ESPARTO GRASS. It is a rather handsome plant, with extensive root-stocks, which run about and ramify under the sand amongst which it grows. There are doubtless many grasses in India which might easily enough be used for paper-making, such as **Saccharum Munja** and **S. sara**. Information as to experiments of this nature, with flowering samples for identification, are much required. See also next species.

MACROCHLOA.

Macrochloa (? Stipa) tenacissima, GRAMINEÆ. 161

A rush-like grass, growing plentifully on the sandy tracts of the Mediterranean Coast, especially in Spain, Algeria, Morocco and the Sahara. This is the true **Esparto Grass**, which, from remotest times, has been used for making hats, mats, baskets, chairs, agricultural ropes, &c., and in which during later times an immense trade has arisen, for the manufacture of paper. **Saccharum Munja** has long been used for cordage, and forms a strong and useful rope, much used by boatmen in the North-West Provinces. Lists of Indian substitutes for **Esparto Grass**, with all available information upon this subject, and flowering specimens for identification, would be most acceptable.

MALACHRA.

Malachra capitata, *L.*, MALVACEÆ. 162

Vern.—*Ran-bhendi*, BOM.

It occurs throughout the hotter parts of India, from the North-West Provinces to the Carnatic, and thrives in Bombay and Bengal. *The Flora of British India* remarks that this plant is not mentioned by Roxburgh

MARS-DENIA.

or included in **Wallich's** Catalogue. It is probable, therefore, that it is only of recent introduction from South America.

An erect annual, with broad heart-shaped leaves covered with stiff hairs. The flowers are yellow or white.

It yields a fibre 8 to 9 feet long, with a silvery lustre, and almost as soft as silk.

Dr. King reports that for paper-making this does not seem to promise much. It has been experimented with in Bombay as a substitute for jute and reported upon favourab by the manager of the factory.

163 **Manilla Hemp (Musa textilis),** Musaceæ.

This is one of the most valuable of fibres, the finer quality being used for fabrics, and the coarser, for cordage. Attempts, hitherto unsuccessful, have been made to introduce this plant. Experiments with indigenous wild plantains are more likely to prove successful, for there is every chance that one of those common in our tropical forests at the foot of the hills will prove as rich in fibre as the Philippine Island plant. It is unsatisfactory to experiment with the cultivated fruit-yielding species, if it is desired to discover an Indian source of Manilla Hemp. (See also **usa textilis.**)

MAOUTIA.

164 **Maoutia Puya,** *Wedd.*, Urticaceæ.

Vern.—*Poi, pua,* Hind.; *Puya,* Nepal; *Kyinki,* Lepcha; *Yenki,* Limbu.

A shrub, with very white leaves, found in the Himalaya from Garhwal eastward, the Khásia Hills and Burma, chiefly in old cultivations and up to 4,000 feet.

It yields a strong fibre of very good quality, used to make fishing nets, net bags, twine and cloth.

MARANTA.

165 **Maranta dichotoma,** *Wall.*, Scitamineæ.

Syn.—Phrynium dichotomum, *Roxb.*

Vern.—*Pati, mukta-pati, pati-pati,* Beng.; *Thin,* Burm.

It grows in Eastern Bengal, Assam, the Coromandel Coast and Burma

It yields the *Shital-pati* mats which are made of the split stems. These are smooth and cooling, and by Europeans are often placed under the sheets in a bed to prevent the mattress from being too heating. **T. N. Mukharji**, in his *Amsterdam Catalogue*, says: "The stems are slit and made into smooth mats which, owing to their coolness, are largely used in the hot weather for sleeping on. Some of the finest cost about £5 each." Those in general use average from R 2 to 3.

MARSDENIA.

166 **Marsdenia Roylei,** *Wight,* Asclepiadeæ.

Vern.—*Murkula,* Hind.; *Pathor,* Chenab; *Tar, veri,* Salt Range; *Kurang,* Simla.

A small climber of the Eastern and Western Himalaya.

It yields a fibre, of which fishing nets and strong ropes are manufactured.

Marsdenia tenacissima, *W. & A.* 167

Syn.—ASCLEPIAS TENACISSIMA, *Roxb.*
Vern.—? *Haba* (from Dymock).

A climber of Kumaun, Oudh, Behar, and Bengal, and extending to Chittagong and Ava.

Yields the silky fibre known as Rajmahal Fibre. A string, Roxburgh says, broke with 248 lbs. when dry, and with 342 lbs. when wet, as compared with hemp, which broke with 158 and 190 lbs.

This fibre has been much neglected.

M. tinctoria, *R. Br.* 168

Syn.—ASCLEPIAS TINCTORIA, *Roxb.*
Vern.—*Kali lara,* NEPAL; *Ryom,* LEPCHA.

A climbing shrub of the North-Eastern Himalaya and Burma.

Like the preceding, this species yields a fibre, but it is collected on account of its dye more than for its fibre.

MELIA.

Melia Azadirachta, *Linn.* 169

THE NEEM or MARGOSA TREE.

Vern.—*Nim,* HIND.; *Azad-darakht, neb,* PERS.; *Kohumba,* GUZ.; *Baka-yan,* BOM. & SIND; *Veypam,* TAM.; *Yapa, yepa,* TEL.; *Thimbawtamaka,* BURM.

A large tree, planted and self-sown throughout the greater part of India and Burma.

The bark yields a fibre, of which a specimen, supplied by the Madras Forest Department, was sent to the Amsterdam Exhibition.

MELOCANNA.

Melocanna bambusoides, *Trim.,* GRAMINEÆ. 170

BAMBOO.

Syn.—BAMBUSA BACCIFERA, *Roxb.*
Vern.—*Múli, metunga, bish,* BENG.; *Kaoung-wa,* MAGH (*Gamble*).; *Kayinwa,* BURM.

The common gregarious bamboo of the Chittagong hills; might be used in paper manufacture.

Specimens required, there being none in the present collection.

MELOCHIA.

Melochia velutina, *Beddome,* STERCULIACEÆ. 171

Vern.—*Al-abada,* AND.

A small tree of the Andaman Islands, Burma, and Malay Archipelago.

A strong fibre is prepared from the bark of this tree which, in the Andaman Islands, is called *Betma-da.* From this a stout cord is prepared which is woven into the turtle net of the Andaman Islands, known as *Yito-tēpinga-da.*

MELODINUS.

172 **Melodinus monogynus,** *Roxb.*, APOCYNACEÆ.

Vern.—

A tall, milky climber of Sikkim and the Khásia Hills, and also indigenous in Sylhet.

The bark contains a quantity of fibrous matter, which the natives of Sylhet substitute for hemp.

MEMORIALIS.

173 **Memorialis pentandra,** *Wedd.*, URTICACEÆ.

Vern.—*Jaiphal-jari*, GARHWAL.

It is somewhat common in the lower hills.

Yields a useful cordage fibre. (*Atkinson.*)

[218] **Mezenkuri.** *See* Silk.

MORINGA.

174 **Moringa pterygosperma,** *Gaertn.*, MORINGEÆ.

THE HORSE RADISH TREE.

Vern.—*Soanjná, sanjná, senjná*, HIND.; *Sujaná, sajna*, BENG.; *Segata, segavá*, BOM.; *Swanjera*, SIND; *Morunga*, TAM.; *Saihan*, TEL.; *Dantha-lon, daintha*, BURM.

A tree wild in the Sub-Himalayan tract from the Chenab to Oudh; commonly cultivated in India and Burma on account of its leaves, flowers, and pods, all of which are eaten.

The bark yields a coarse fibre from which mats, paper, or cordage may be prepared.

175 **Mulberry Cloth,** OR **Mulberry paper cloth.**

Broussonetia papyrifera, *Vent.*, URTICACEÆ.

Vern.—*Malaing*, BURM.

A small tree about 30 feet high, wild on the Martaban coast and in China, Japan and the South Sea Islands.

The Japanese prepare their paper from the bark of this tree, and the Burmese their papier mâché trays (*Palabaik*), used like the slates of European school-boys. A coarse cloth is also prepared from it, used by the Karens and largely so by the South Sea Islanders. These savage islanders may be described as the inventors of the Ekman process for the extraction of fibre, having from time immemorial separated the paper mass from the fibre by boiling in an alkali.

Munga. *See* Silk.

MUSA.

176 **Musa paradisiaca,** *Linn.*, SCITAMINEÆ.

THE PLANTAIN.

Vern.—*Kela*, HIND., BOM.; *Kala*, BENG.; *Kadali*, SANS.; *Vashaip pasham*, TAM.; *Huga pyaw*, BURM.

Extensively cultivated throughout India.

A beautiful fibre is obtained from the stems, though inferior to that of the Manilla Hemp. The fibre is extracted in two ways, 1st, by fermentation, and 2nd, by machine crushing. If the former course is to be followed, the trees are left to dry to a certain extent on the ground so as to lessen the weight of transporting. If the former, the tree must be carried to the mill at once and passed under the rollers. About 4 lbs. of fibre are obtained from each tree, the leaf petioles being reported as yielding the most valuable fibre, and relatively they contain more fibre than the trunk. After crushing the fibre is boiled to separate the gluten, carbonate of soda and quicklime being used. To make 3 tons of fibre per day, it is necessary to have four boilers of 800 gallons each and to give five boilings in the day yielding 1,680 lbs. of fibre for each boiler. They require about 300 lbs. of soda and a proportionate amount of quicklime. The fibres of different quality should be kept separate in the boiling, the lighter fibres requiring only about six hours to bleach, while the darker require eighteen. A lever is arranged to lift the boiling fibre to the tanks to be washed. The washing must be thorough, the fibre thereafter should be hung up to dry. (*Christy's New Commercial Plants.*) Considerable attention has of late years been attracted to the subject of plantain as a source of paper. It cannot be doubted that a great future is before the paper industry of India, and that the thousands of plantain stems which are annually thrown away as useless by the natives will yet come to be greedily purchased for paper manufacture.

Musa sapientum, *Linn.* 177

THE BANANA.

The vernacular names given under the preceding apply to this species. The stems may be used for the same purposes. There seems to be a promising future for plantain paper.

M. textilis, *Louis, Nees.* 178

MANILLA HEMP.

Vern.—*Kaudira, ránakela,* BOM. (*from* Dymock.)

A native of the Philippine Islands, now thoroughly introduced in the Madras Presidency.

"It has of late years been much employed for cordage of various kinds, especially when considerable strain is required, as in ropes for raising goods into warehouses or out of mines. Some yachts, as well as many American vessels, have the whole of their rigging composed of MANILLA HEMP, and this cordage, when worn out, can be converted into an excellent quality of paper. Though the plant yielding this fibre is not indigenous in India, nor extensively cultivated, it is yet extremely interesting, not only because it may easily be cultivated there, but because there are other species of the same genus which may be turned to the same useful account." (*Royle.*) See also **Manilla Hemp.**

NELUMBIUM.

Nelumbium speciosum, *Willd.,* NYMPHŒACEÆ. 179

LOTUS.

Vern.—*Kanwal,* HIND.; *Padma,* BENG.; *Kamala, nilophar* (*pubbun,* The seeds, *Kamalakadi (doda), puboora*) (*from* Dymock), SIND.; *Tamaray,* TAM.; *Tamara,* TEL.

Throughout India, extending as far to the North-West as Kashmir.

The long stalks of the Lotus yield a sort of yellowish white fibre, which is used principally for the wicks of sacred lamps in Hindu temples;

and the Hindu doctors are of opinion that the cloth prepared from this fibre acts medicinally as a febrifuge. (*Baden-Powell.*)

Further information and specimens might be supplied by the Punjab.

OCIMUM.

180 **Ocimum Basilicum,** *L.*, LABIATEÆ.

Var.—O. PILOSUM, *Benth., sp. Roxb. Fl. Ind., Ed. C.B.C.,* 464.

SWEET BASIL.

Vern.—*Báboi tulsi, bábui ghás,* BENG.; *Shahasfaram,* ARAB.; *Manjirika* (?), *Sabsah,* DEC.; *Tirunitrup-pattiri,* TAM.; *Vibudipatri,* TEL.; *Kam kasturi,* KAN.

A shrubby, herbaceous plant, common throughout the damp tropical forest of India and Burma.

Spons' Encyclopædia gives the following curious fact regarding this plant which seems unknown to most other authors:—

"It is cultivated to a small extent in the Hugli district, on account of the strong fibre it yields for rope-making. The rope can be used only in the dry season as it rots in the rains. The fibre might be available for paper-making." This was apparently extracted from **Baboo Hem Chunder Kerr's** report on Jute, where mention is made of this fact, page 102. **Babu T. N. Mukharji,** in his *Amsterdam Descriptive Catalogue,* gives part of a letter from Mr. Bowstead of Haripur Factory in the Bhagalpur district, Bengal, describing a fibre from a plant called *Marva* which has been identified with **Ocimum pilosum? Artemisia vulgaris.** The vernacular name given is that of **Eleusine coracana** (a species of Millet). There is of course some mistake regarding the scientific names ascribed to this curious plant; but as considerable interest must be associated with the discovery, I beg to be supplied with specimens to enable me to accurately name the plant. The seeds of **Ocimum Basilicum** *var.* **pilosum** are largely used, especially by the Muhammadans of Eastern Bengal, to produce a refreshing and cooling drink. When thrown into water they swell and become surrounded with a thin gelatinous layer. That **Artemisia vulgaris** (*Wormwood*) could be eaten or yield a fibre seems highly improbable, while **Eleusine** might be used as a paper-yielding fibre, and is certainly eaten.

ODINA.

181 **Odina Wodier,** *Roxb.*, ANACARDIACEÆ.

Vern.—*Kiamil, kimúl, kamlái, jhingan, mòwen,* HIND.; *Jiyal, lohar-bhadi,* BENG.; *Simati, moya,* BOM.; *Wodier,* TAM.; *Gumpini, dumpini,* TEL.; *Hnabé,* BURM.

A moderate-sized or large, deciduous tree of the Sub-Himalayan tract from the Indus eastward, ascending to 4,000 feet; found also in the forests of India and Burma.

The bark yields a coarse cordage, but a good bast, fibre.

OPUNTIA.

182 **Opuntia Dillenii,** *How.*, CACTEÆ.

THE PRICKLY PEAR.

Vern.—*Nagphana, nagphansi,* HIND.; *Pheni-mansa,* BENG.; *Papashkali,* KAN.; *Chaffalsend,* DEC.; *Nagadali,* TAM.

An erect, fleshy, thorny shrub, common all over the arid and dry zones of India, and often planted as a hedge. It was originally brought from America. (*Gamble.*)

A coarse fibre is obtained from it, suitable for the manufacture of paper. Dr. Bidie writes: "This abounds in every part of the country, and has become such a nuisance that large sums are expended annually in cutting it down, and burying it, on sanitary grounds." Public money might with great advantage be spent in ascertaining if this nuisance could not be converted into a source of wealth. The supply would certainly never be in the least affected by the utilisation of the fibre for paper manufacture, and in a half pulp state it might be exported to Europe at a very low figure.

ORTHANTHERA.

Orthanthera viminea, *Wight.*, ASCLEPIADACEÆ. 183

Syn.—APOCYNEA VIMINEA, *Wall.*; LEPTADENIA VIMINEA, *Bth.*, *Hook.*

Vern.—*Mahui*, HIND.; *Mowa, lancbar*, TRANS-INDUS; *Matti*, BEAS; *Khip*, DELHI; *Kip*, SIND; *Chapkia*, KUMAUN.

A glabrous shrub of the arid and northern dry region from Sind to Oudh.

It yields a fibre, of which rope is made, often used in conjunction with that obtained from **Leptadenia spartium,** *Wight*, for Persian water wheels and moats in Sind and the Punjab.

ORYZA.

Oryza sativa, *Linn.*, GRAMINEÆ. 184

THE RICE.

The straw of the ordinary rice has been recommended as a paper material, especially the roots.

PÆDERIA.

Pæderia fœtida, *Linn.*, RUBIACEÆ. 185

Vern.—*Gundali*, HIND.; *Gunda-bhaduli*, BENG.

From the Central and Eastern Himalayas, ascending to an altitude of 5,000 feet, southward to Malacca and westward to Bengal. Common around Calcutta, and also in Assam.

The best fibre is obtained from plants which grow on the alluvial deposits of rivers, as on the banks of the Brahmaputra. The fibre is strong and flexible, and has a silk-like appearance. The root is used in native medicine as an emetic. (*Roxburgh.*) The fibre has recently been attracting much attention in India.

PANDANUS.

Pandanus Andamanensium, *Kurz.*, PANDANEÆ. 186

A tree of the Andaman Islands.

In the Andaman Islands various articles of apparel are made from the fibre, such as tail worn by the women.

187 **Pandanus odoratissimus,** *Willd.*

THE FRAGRANT SCREWPINE.

Vern.—*Keura*, HIND., BOM.; *Kea, ketuki, keori*, BENG.; *Mugalik, kutaki*, TEL.; *Thalaytalum, tashan*, TAM.; *Satthapu*, BURM.; *Kaida, thala*, MAL.; *Muda-kaiyeya*, CINGH.; *Kadar*, ARAB.; *Kadi*, PERS.

A common, much-branched shrub, frequently planted on account of the powerful fragrance of the flowers, but wild on the coasts of South India, Burma, and the Andamans. It is found abundantly in Bengal, Madras, Straits Settlements and the South Sea Islands.

"The leaves are composed of tough, longitudinal fibres, white and glossy, which enable them to be employed for covering huts, making matting, as well as for cordage, in the South Sea Islands; and in Mauritius for making sacks for coffee, sugar and grain." (*Him. Bot., p. 408.*)

The fibre from the leaves might be profitably used in the preparation of paper.

PARKINSONIA.

188 **Parkinsonia aculeata,** *Linn.*, LEGUMINOSÆ.

An introduced shrub, or small tree, now almost naturalised in India, especially in the arid zones, where it is grown as a hedge plant, particularly in Madras. Curiously enough, I found it plentiful as a hedge plant in Manipur.

It yields a fibre of a beautiful white colour, a sample of which was sent to the Exhibition of 1851 as a material for paper-making. The fibre is considered as wanting in strength, though it may be made useful for mixing with other fibrous substances and beaten into a half stuff. (*Royle.*)

PARROTIA.

189 **Parrotia Jacquemontiana,** *Decaisne*, HAMAMELIDEÆ.

Vern.—*Páser, peshora, po, kilár, kirru*, PB.

A large, deciduous shrub of the North-West Himalaya, from the Indus to the Ravi, between 2,800 and 8,500 feet.

The chief use of the wood is in basket-work and in the making of bridges on the Himalayan rivers. The twigs are very tough and flexible, and are twisted together to make thick ropes, often 300 feet long.

PAVONIA.

190 **Pavonia odorata,** *Willd.*, MALVACEÆ.

Vern.—*Peramuti-pu*, TAM.; *Eira-kati*, TEL.

Cultivated in gardens for its fragrant flowers in the North-West Provinces, Sindh and Banda, Western Peninsula, Burma, and Ceylon.

The plant yields a fibre.

191 **P. zeylanica,** *Cav.*

Vern.—*Sittamutti*, TAM.

North-West Provinces, Sind, Western Peninsula, and Ceylon.

The plant yields a fibre.

PERIPLOCA.

Periploca aphylla, *Decaisne,* ASCLEPIADEÆ. 192

Syn.—CAMPELEPIS VIMINEA, *Falc.*

Vern.—*Buraye,* SIND; *Barrarra, bane,* TRANS-INDUS; *Battia,* JHELUM and CHENAB.

A shrub of the arid, dry northern zones of the Punjab and Sind.

It yields a good fibre, which, **Royle** says, is used along with the fibre of **Leptadenia Spartium** to form the ropes, &c., required for wells and water-lifts; the combined fibre is not much affected by the moisture. **Stocks** says: "used for cordage; flowers fragrant, eaten by the natives, taste like raisins."

PHŒNIX.

Phœnix farinifera, *Willd.*, PALMÆ. 193

Vern.—*Chilta-eita,* TEL.; *Ichal,* KAN.

A small, almost stemless, palm of sandy lands, near the sea at Coringa. The leaves are used for making mats.

P. paludosa, *Roxb.* 194

Vern.—*Hintal, hital, golpatta,* BENG.; *Thinbaung,* BURM.

A soboliferous, often gregarious, palm of the Sunderbuns, Burma and Andaman Islands.

Its leaves are used in the Sunderbuns to make rough ropes for tying boats and logs, and for thatching.

P. sylvestris, *Roxb.* 195

THE WILD DATE PALM.

Vern.—*Khajur, khaji, thalma,* HIND.; *Shindi,* MAHR.; *Pedda, cita,* TEL.; *Peria-eetcham,* TAM.; *Ichal,* KAN.

A tree with ashy, grey foliage, wild and cultivated throughout India.

The fibrous leaflets and the fibre from petioles are made into mats, ropes and baskets.

PHORMIUM.

Phormium tenax, LILIACEÆ. 196

NEW ZEALAND FLAX.

Originally a plant of New Zealand, now largely cultivated in waste lands bordering on the sea in tropical or warm temperate countries, such as St. Helena, Algiers, South France, and the Orkney Islands.

The fibre is soft, white, and of a silky lustre, and is now largely used for making ropes and paper.

There does not seem to be much chance of this ever becoming an Indian fibre half so valuable as many indigenous Indian plants, although in some parts of the country it might easily enough be acclimatised. It is stronger than either flax or hemp. It is naturally white and takes colour freely.

Mr. Cameron says that this plant has been introduced, and succeeds well, in the South Wynaad. On exposed grass-land, at an elevation of 2,000 to 3,000 feet, it grows with great vigour.

PINUS.

197 **Pinus sylvestris,** *Linn.*, CONIFERÆ.

THE SILVER FIR.

By the Ekman process this or any other species of pine wood may be reduced to a cellulose pulp and made from the boiler direct into paper, which, without the aid of a microscope, cannot be distinguished from paper made from ordinary fibres or linen.

Pita Fibre. *See* **Agave americana.**

POLLINIA.

198 **Pollinia eriopoda,** *Trim.*, GRAMINEÆ.

Syn.—ANDROPOGON INVOLUTUS, *Stend.*; SPODIOPOGON ANGUSTIFOLIUS, *Trim.*

This is the plant which yields the fibre made into *Babar* strings, so largely used in the tract between the Jumna and the Sarda. It is particularly abundant in the Garhwal Himalaya, and **Stewart** suggests that it might be found useful as a paper material. *See* also **Eriophorum comosum** (*Wall*).

POLYALTHIA.

199 **Polyalthia longifolia,** *Benth. & Hook. f.*, ANONACEÆ.

Syn.—UVARIA LONGIFOLIA, *Lam.*; GUATTERIA LONGIFOLIA, *Wall.*

Vern.—*Asok, debdári,* HIND.; *Asoka, asúpála,* BOM.; *Assothi,* TAM.; *Asoká devadaru,* TEL.

A large, evergreen tree with smooth bark, wild in Ceylon, and planted as an avenue tree throughout Bengal and South India.

A good bast fibre was shown me by **Babu T. N. Mukharji**, which was said to have been prepared from the inner bark of this tree and sent to the Amsterdam Exhibition.

POUZOLZIA.

200 **Pouzolzia viminea,** *Wedd*, URTICACEÆ.

Vern.—*Chhota kúail,* NEPAL; *Kyingbi,* LEPCHA.

A shrub or small tree, with thin grey bark, of Kumaun, Nepal, Sikkim, Eastern Bengal, Assam, and Chittagong, ascending to 5,000 feet.

The bark is used to make ropes.

SACCHARUM.

201 **Saccharum fuscum,** *Roxb.*, GRAMINEÆ.

Vern.—*Pati-hori,* BENG.; *Kilik,* N. W. P.; *Tat, neja,* HIMALAYAN NAMES.

The culms are used in the manufacture of pens and screens; the leaves and reeds, for thatch; and the leaf-sheaths, like those of most wild species of this genus, may be used to supply the fibre from which the sacrificial thread is prepared.

Saccharum Mara, *Roxb.* 202

Vern.—*Sarpat, sara, sarkara, shur,* HIND.; *Sara, shar,* BENG.; *Gundra,* TEL., SANS.

Common in the plains.

The fibre is inferior to **S. Munja.** The reeds are used for matting, thatching, chairs, &c. The flower tops may be used as a paper material. It is used in Mirzapur for tow-lines, and must, therefore, possess tenacity and strength. (*Atkinson.*)

The leaves are sometimes made into mats, and bundles of the stems of this or other species of **Saccharum** are used for floating heavy timber on the rivers. **Coldstream** states, the young flowering tops are regarded as good fodder for milch cows, and that the poor people in the Punjab eat the pith. The root of this species, and that of **S. Munja** and **S. spontaneum**, are used by the natives as a medicine under the name of *Darba ganda.* It is burned near women after child-birth, or near scalds, its smoke being regarded as beneficial. (*Stewart.*)

S. Munja, *Roxb.* 203

MUNJ GRASS.

Vern.—*Munja, sirki,* the upper half of culm; *Seutha, sarpat,* the lower half; the blade and sheath yield the strong cordage known as *Munj-sarkanda* (or *kana*), *sarra,* PB.

This grass is common in North India.

It is useful in the manufacture of strong ropes, strings, mats, and paper. For ropes it is much valued on account of its elasticity and strength, and a power of resisting moisture, common to few other fibres. The *Sirki* is used for thatching, covering carts, and constructing exceedingly cheap chairs. Under the name of *Vind* and *Munj,* a large quantity of the products of this plant reach the plains of the North-West Provinces from the lower hills. (*Atkinson.*) It is very abundant in the Punjab, often covering whole tracts of country, its tufted masses constituting a formidable obstacle to agricultural progression, it being almost impossible of extermination.

The flower-heads and sheaths of this plant constitute the best paper grass material in India. The *bán-múnj* is the flower sheath from which the natives prepare a fine thread.

Munja and several species of **Saccharum** is largely used in the Upper India Paper Mill near Lucknow.

Specimens of the different plants so used, and of the ropes, thread, paper or paper half stuff much required.

S. officinarum, *Linn.* 204

THE SUGAR-CANE.

Vern.—*Ükh, ganná,* HIND., BENG.; *Usa* MAHR.

The refuse of the sugar-cane mill has been recommended as a paper material.

S. semidecumbens, *Roxb.*

Vern.—*Khori,* BENG.

This species is used indiscriminately with **S. fuscum.**

S. spontaneum, *Linn.* 205

Vern.—*Kans, kagara, kosa, kus,* HIND.; *Kash,* BENG.; *Rellu-gaddi,* TEL.; *Khan, kahu,* SIND.; *Kahi, káns,* PB.; *Kásá,* SANS.; *Kagara,* MAHR.

Common in Bengal, the Sub-Himalayan tract and Bundelcund.

The grass is used to make rope and mats and for thatching; and pens are made of its reeds. It is given as fodder to buffaloes and elephants.

SALIX.

206 **Salix babylonica,** *Linn.*, SALICINEÆ.

THE WEEPING WILLOW.

Vern.—*Bisa, bada, bed, katira, majnún,* PB.; *Giur,* KASHMIR; *Tissi,* NEPAL.

It is cultivated in North India. Said by **Stewart** to be indigenous in the Sulaiman Range.

The branches are made into baskets.

207 **S. daphnoides,** *Vill.*

Vern.—*Bed, bidái, betsa, bashal,* PB.; *Yúr,* KASHMIR; *Changma,* WEST TIBET; *Richang,* LAHOUL.

A shrub of the North-West Himalaya, both on the outer ranges and in the inner arid tract. It extends to the Alps and the mountains of Central Europe.

The twigs are used for baskets.

208 **S. tetrasperma,** *Roxb.*

Vern.—*Bed, bent, baishi,* HIND.; *Pani jama,* BENG.; *Laila, bains,* N. W. INDIA; *Bis, beis, bitsa, bin, magsher, safedar,* PB.; *Yir,* KASHMIR; *Bilsa,* OUDH; *Bhesh,* GÁRO; *Bhi,* ASS.; *Wallunj,* BOM.; *Niranji,* KAN.; *Momaka,* BURM.

A moderate-sized, deciduous tree, found throughout India, on river-banks and moist places, and in the Himalayan Valleys, ascending to 6,000 feet.

The twigs are made into baskets.

209 **S. Wallichiana,** *And.*

Vern.—*Bwir,* PB.; *Bhains, bhangli, katgúli,* N. W. P.

A large shrub of Afghanistan, Kashmir, Himalaya, eastward to Bhutan, ascending to 9,000 feet.

The branches are made into baskets.

SANSEVIERIA.

210 **Sansevieria zeylanica,** *Willd.*, HÆMODORACEÆ.

THE BOW-STRING HEMP.

Syn.—It seems doubtful if the Bengal plant (**S. Roxburghiana**) should be viewed as the same as that met with in Ceylon.

Vern.—*Murba, murahara, murgli,* BENG.; *Murgali,* DEC.; *Mallai, mangi,* SALEM; *Ghonasaphan,* MAHR.; *Tshama-cada, chaga, saga,* TEL.; *Marúl,* TAM.; *Marura,* SANS.

A stemless bush with a rosette of 6 to 8 succulent leaves, the inner ones being often 4 feet long and ending in a long straight spine; scape rising from the centre 1 to 2 feet long, flowers greenish, white, erect 4 to 6 together in clusters. (Compare with **Yucca gloriosa.**)

It makes its appearance on the coast of Bengal, extending to the Madras Presidency, common on the Coromandel Coast, in great abundance in Cumbum and in Dindigul District. It is also plentiful in Ceylon extending to Java, the coast of China, and Africa. It is probable that the Java and African plants are distinct species, the latter bearing the name of **S. guineensis.**

From the succulent leaves is extracted a beautiful, soft, silky fibre, held in high esteem by the natives on account of its elasticity and its consequent suitableness for bow-strings. **Sir W. Jones** says: "From the leaves of this plant the ancient Hindus extracted a very long, elastic thread, called *Maurvi,* of which they made bow-strings, and which for that reason was ordained by Menu to form the sacrificial zone of the military classes." This fibre was mistaken by **Roxburgh** for the China grass (*Rhea*). It is easily cultivated and associated with Yucca fibre and deserves every attention. Specimens of dried leaves, of the root, and of the fibre and the fabrics manufactured from it should be supplied by Madras. The fibre is much valued in Europe for ropes used in deep-sea dredgings, and makes a very superior paper.

SARCOCHLAMYS.

Sarcochlamys pulcherrima, *Gaudich,* Urticaceæ. 211

Syn.—Urtica pulcherrima, *Roxb.*

Vern.—*Tsatya, sapsha,* Burm.

A large, handsome shrub with tri-nerved leaves, grey beneath; common in Eastern Bengal and Burma, especially in deserted cultivation.

The liber gives a good fibre for ropes.

SESBANIA.

Sesbania aculeata, *Pers.,* Leguminosæ. 212

Vern.—*Dhanicha,* Beng.; *Kán-sevari,* Mahr.; *Erra-jilgua,* Tel.

This plant is found in Bengal and South India.

A strong fibre is extracted from its stalks, which is made into ropes and fishing nets, as water cannot act upon it. This fibre is considered superior to Jute in strength and durability. It is best suited for the manufacture of cordage, for which purpose it is preferred to **Crotolaria** and **Corchorus**.

S. ægyptica, *Pers.* 213

Syn.—Æschynomene sisban, *Roxb.*

Vern.—*Jait, jhinjan, janjhan,* Hind.; *Jayanti,* Beng.; *Saori,* Berar; *Shewari,* Dec.; *Sevari,* Mahr.; *Suiminta,* Tel.; *Yethagyi,* Burm.

A soft-wooded tree, cultivated in many parts of India and Burma, wild in tropical Africa.

The bark is made into rope.

S. Grandiflora, *Pers.,* Leguminosæ. 214

Syn.—Æschynomene grandiflora, *Roxb.*; Agati grandiflora, *Desv.*

Vern.—*Basna,* Hind.; *Buka, bak,* Beng.; *Shevari, agasta,* Mahr.; *Agati,* Tam.; *Avesi,* Tel.; *Poukpan,* Burm.

Cultivated throughout India and Burma; a doubtful native.

A handsome, small tree with pink flowers. The inner bark appears to be likely to yield good fibre. (*Dymock.*)

SIDA.

215 **Sida carpinifolia,** *Linn.*, MALVACEÆ.

Syn.—S. ACUTA, *Burn.*; S. LANCEOLATA, *Roxb.*

Vern.—*Kareta*, BENG., HIND.; *Tupakariya*, MAHR.; *Vatta-tirippi*, TAM.; *Chitimuti*, TEL.

A small plant found chiefly in South India.

A good fibre is obtained from the stems.

216 **S. cordifolia,** *Linn.*

Vern.—*Bijband, muttava*, HIND.; *Berela, bala*, BENG.

A small weed generally found in moist places.

The plant yields a fine, white fibre.

217 **S. rhombifolia,** *Linn.*

Vern.—*Swet-berela*, BENG.; *Athiballa-chettu*, TAM.

It grows abundantly in Northern Bengal in the rainy season.

The bark of this plant yields, according to **Dr. Roxburgh**, a large quantity of very delicate, flaxy fibre. *Spons' Encyclopædia* says that it affords much fibre, having great strength, and average length and fineness.

Silks and Silk-worms.

Silk is produced by two families of Lepidopterous insects called **Bombycidæ** and **Saturniidæ.** The first of these two families comprises four genera, viz., **Bombyx, Ocinara, Theophila, Trilocha.**

BOMBYX.

The **Bombyx** includes six species, enumerated by **Mr. Frederic Moore** in a list published in **Mr. Thos. Wardle's** *Hand-book of the Wild Silks of India.* They are as follows, and form the class of worms commonly known as "the domesticated silk-worm," or "the mulberry silk-worm":—

218 **B. arracanensis,** *Hutton.*

The Burmese silk-worm, domesticated in Arracan, said to have been introduced from China through Burma; yields several broods annually; cocoons larger than the Bengal monthly species.

219 **B. crœsi,** *Hutton.*

The *Nistri* or *Madrasi* of Bengal, introduced from China; domesticated in Bengal; yielding seven or eight broods of golden yellow cocoons in the year, of larger size than **B. sinensis.**

220 **B. fortunatus,** *Hutton.*

The *desi* (commonly spelt *dasee*) of Bengal; yields several broods annually, spinning the smallest cocoon of a golden yellow colour.

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Bombyx mori, *Linn.* 221

The common silkworm, domesticated in China, Bokhara, Afghanistan, Kashmir, Persia, South Russia, Turkey, Egypt, and Algeria, Italy, France, and Spain, in all of which countries it produces but one crop annually, spinning the largest cocoon and the best silk of a golden yellow, or white.

B. sinensis, *Hutton.* 222

The *Sina, Cheena,* or small Chinese monthly worm of Bengal, partially domesticated in Bengal, where it was introduced from China; produces several broods in the year; cocoon white and yellow.

B. textor, *Hutton.* 223

The *Boropulu* of Bengal, domesticated in South China and Bengal; an annual only, producing a white (sometimes yellow) cocoon, of a different texture and more flossy than **B. mori.**

The other three genera, commonly classed amongst wild silk-worms, are, as follows:—

OCINARA.

O. diaphana, *Moore.* 224

Khásia hills.

O. lactea, *Hutton.* 225

Mussooree, North-west Himalaya up to Kulu, feeds on **Ficus venosa,** spinning a small, yellow cocoon, yielding several broods during the summer.

O. moorei, *Hutton.* 226

Mussooree, North-west Himalaya, also found in Dehra Dun; also feeds on **Ficus venosa** as well as on the wild fig, spinning a small, white cocoon; it is multivoltine.

THEOPHILA.

T. bengalensis, *Hutton.* 227

The wild silk-worm of Lower Bengal, discovered in the neighbourhood of Calcutta feeding on **Artocarpus lacoocha;** found also at Ranchi, in Chota Nagpur.

T. huttoni, *Westwood.* 228

The wild silk-worm of the North West Himalaya. A wild species, the worms being found abundantly feeding on the indigenous mulberry in the mountain forests of the North West Himalaya.

T. mandarina, *Moore.* 229

The wild silk-worm of Chekiang, North China. Worms stated to feed on wild mulberry trees, spinning a white cocoon.

T. religiosa, *Helfer.* 230

The *Jori* of Assam and *Deo-muga* of Cachar; feeds on the *bur* tree (**Ficus indica**) and the *pipul* (**F. religiosa**).

SILK and SILK WORMS.

231 **T. sherwilli,** *Moore.*

The wild silk-worm of the South East Himalaya (also found in Sikkim).

TRILOCHA.

232 **T. varians,** *Walker.*

North and South India.

MULBERRY SILK INDUSTRY.

The domesticated or mulberry silk-worms form an industry quite distinct from that connected with the wild silks. **Mr. L. Liotard,** in a memorandum just published by the Government of India, gives a full account of the industry, and the following extracts are taken from it:—

"The multivoltine worms are confined chiefly to Bengal, where they produce three chief crops, locally termed *bunds, i. e.,* three seasons of hatching, feeding, spinning and gathering the cocoon. The November bund extends from 1st October to end of February, the March bund from 1st March to 30th June, the July bund from 1st July to 30th September. The worms thrive best in the cold season, *i. e.,* in the October-February bund. In this bund the *boro-poloo,* or annual worm, is also reared in Murshedabad and a few other places. The March bund is not so good; and the rainy season bund is the worst.

"In Upper India and in Kashmir the univoltine worms are those usually reared; the rearing takes place in February and March; and the eggs obtained in the latter month are stored in cool places or sent to the hills to preserve them from the effects of the summer heat. Towards the middle of the following February, when the mulberry trees send forth new leaves, the eggs are brought back to the rearing houses and allowed to hatch.

In Bengal.—"The cultivation of the mulberry and the rearing of the worms are conducted by the peasantry and by two different classes the cultivator of the mulberry and the rearer of the worms of people who are under no obligation but their own interests. The destination of the cocoons is two-fold: they are as a rule either sent to small native filatures where the silk is roughly wound and usually consumed in the hand-looms of the country, or consigned to Madras, or to the Bombay mills; or they are brought to the great European factories in Bengal where, after being reeled by steam machinery, the silk is consigned direct to Europe. The chief silk-producing districts are Rajshahye, Murshedabad, Malda, Birbhum and Midnapur, with Nuddea, Bankura, Bogra and Rungpur of less importance * * *."

The industry has, during several years, been in a declining condition. **Mr. Liotard** says:—

"Different opinions have been advanced to account for the decline in the silk industry of Bengal. The extensive importation from Japan and China to Europe since the opening of the Suez Canal—the larger yield of recent seasons in Italy and France which receive regular supplies of silk-worm eggs from Japan—the indifferent quality of the Bengal silk, and the probable fact that the demand for silk goods has not kept pace proportionately with the increased supply thrown upon the market—have all been brought forward as so many causes of the stagnation and gradual

SILK and SILK WORMS.

decline of the Bengal silk industry; and perhaps there is some truth in each and all of these opinions. "But there seems to be evidence to lead to the belief that of the European and native sections of the industry, it is the European that has suffered the more seriously. In Rajshahye, the native is almost entirely in the hands of the European section), and the European section complains of the obstinacy with which the native workers in silk demand high prices in the face of the active competition with Bengal silk which has set in from Europe, China and Japan. The native section, however, does not seem ready to lower their prices, or accept any radical change of custom. The Bengal worm suits its circumstances; it eats little comparatively, and thrives on the immature or shrub mulberry leaf which is renewed at every cutting; it is considered less troublesome in rearing, and spins often, being multivoltine, except in Murshedabad and Midnapur, where the annual worm (*boropoloo*) is reared. The silk thread obtained is wanting in wiriness, and a bad system of reeling makes the threads crusty and an abomination to the European silk-thrower. The European firms, who have so great a stake in the Indian industry, have repeatedly made efforts to bring improvements in the native system of rearing and reeling. But the natives care little about that so long as their industry goes on according to custom, and they can raise and dispose of their produce by reeling it off themselves for despatch to other parts of India. European firms find themselves compelled to buy the native produce or close their filatures. These facts may lead to the inference that the native section can go on prospering whatever may happen to the European section; but the Collector of Malda is of a contrary opinion; he writes:

> "'If the European-supervised silk filatures were closed, the native silk industry would still thrive for a long time, but undoubtedly such collapse would recoil upon it and be disastrous to the native silk industry which is so largely subsidised and indirectly guided by European capitalists. Without that capital and guidance and support the native silk industry would, it is believed, become very precarious, and collapse after a time.'

"The native section, however, is not without its vicissitudes: sometimes the worms fail to spin from extremes of heat and cold, from too much rain and cloudy weather in their last stage, and from the want of opportune showers for the mulberries. Sometimes, when the rainy season is good, mulberry leaves are abundant and then the crop of cocoons is fine, and there is a glut in the native silk market, which brings down the price of cocoons and of reeled silk; sometimes again, the silk crops in France, Italy and China are very good and the market for Indian silk is then very bad. Lastly, the rents of land under mulberry cultivation are excessively high, and this, which is not the least of the drawbacks, enhances the cost of producing silk, tempts the rearers to give the very least quantity of leaf required, and causes, by a semi-state of starvation of the worms, the weakness in the silk which renders it difficult to reel without breakage."

North-West Provinces.—Certain experiments made by Government from 1875 to 1882 to ascertain the suitability of the natural conditions of Dehra Dun for the rearing of the annual mulberry silk-worm gave encouraging results, and Messrs. Lister & Co., of Bradford (England), took over the whole enterprise and received an assignment of land in that district for the carrying out of the industry. They have at present an agent who supplies eggs to the native cultivators and purchases the cocoons from them on behalf of his firm, besides himself rearing certain quantities. Elsewhere in the Provinces there is little or no silk produced; the raw material is generally obtained from Bengal and manufactured into cloths in a few places, and Bengal also sends manufactured articles.

SILK and SILK WORMS.

Punjab.—Messrs. Lister & Co. have agents in the Kangra and Gurdaspur districts, who supply eggs to the cultivators and purchase the cocoons produced, which they reel in the filature here established by their firm.

In the other Provinces the production of mulberry silk has not gained any importance, and trials made to introduce or develop the small existing industry, have so far not been fruitful of any marked results. The manufacture of silk cloths, plain and embroidered, continues, however, as of old to be done in several places in the Punjab, the Bombay Presidency, Madras and British Burma, with the raw material imported either from China, Persia or Bengal.

The exports (Indian) of silks, raw and manufactured, to other countries by sea have been as follows during the last three years:—

1	2	3	4	5	6	7	8	9	10
Official years.	Meaning of the figures.	Raw silk.	Chussum or waste silk.	Cocoons.	Thread for sewing.	Piece goods.	Goods of silk mixed with other materials.	Other sorts.	Total values in rupees.
1880-81	Quantities	550,665	733,464	18,447	1,630	2,127,576	215,391	114	...
	Values	48,40,343	6,26,732	14,943	8,144	20,04,065	2,15,026	912	77,10,165
1881-82	Quantities	340,750	747,693	28,583	271	2,126,635	124,630	440	...
	Values	30,17,275	8,34,213	31,143	1,397	20,57,722	1,55,282	1,765	60,98,797
1882-83	Quantities	501,576	834,415	23,452	107	2,589,217	202,847	88	...
	Values	44,10,415	10,04,361	26,656	667	25,19,997	2,43,890	1,200	82,07,186

NOTE.—The quantities in Cols. 3 4, 5, 6 and 9 are lbs; those in Cols. 7 and 8 are yds.; the values are everywhere rupees.

The provinces whence the exports proceed are:—

OFFICIAL YEARS.	NATURE OF SILK.	INDIAN SILKS EXPORTED FROM				
		Bengal.	Bombay.	Sindh.	Madras.	B. Burma.
		Rs.	Rs.	Rs.	Rs.	Rs.
1880-81	Raw	48,12,407	27,841	95	...	...
	Chussum or waste	5,98,502	26,730	...	1,500	...
	Cocoons	14,803	...	...	140	...
	Thread for sewing	8,026	33	85	...	...
	Piece goods	17,47,218	219,482	663	35,575	1,127
	Goods of silk mixed with other materials	60,459	1,51,985	120	2,462	...
	Other sorts	..	...	900	12	...
	TOTAL	72,41,415	4,26,071	1,863	39,689	1,127

SILK and SILK WORMS.

OFFICIAL YEARS.	NATURE OF SILK.	INDIAN SILKS EXPORTED FROM				
		Bengal.	Bombay.	Sindh.	Madras.	B. Burma.
		Rs.	Rs.	Rs.	Rs.	Rs.
1881-82 .	Raw	29,70,024	44,023	1,800	1,428	...
	Chussum or waste . .	7,87,878	40,364	...	5,971	...
	Cocoons	31,138	...	...	5	...
	Thread for sewing . .	245	552	600	...	...
	Piece goods . . .	17,93,848	2,44,466	916	18,387	105
	Goods of silk mixed with other materials . .	17,731	1,35,102	...	1,929	520
	Other sorts . . .	1,120	...	...	645	...
	TOTAL .	56,01,984	4,64,507	3,316	28,365	625
1882-83 .	Raw	44,06,073	4,342	...	...	...
	Chussum or waste . .	9,62,819	28,471	...	13,071	...
	Cocoons	21,956	...	..	4,700	...
	Thread for sewing . .	...	667	...	...	...
	Piece goods . . .	23,12,092	1,88,547	1,346	17,967	45
	Goods of silk mixed with other materials . .	44,059	1,97,564	...	2,267	...
	Other sorts . . .	...	1,200	...	...	...
	TOTAL .	77,46,999	4,20,791	1,346	38,005	45

The countries to which the exports proceed are shown in the next table; the figures are those of 1882-83:—

Countries to which exported.	Raw silk.	Waste silk.	Cocoons.	Piece goods.	Goods of silk mixed with other materials.	Other sorts.	TOTAL.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
France . .	14,51,268	8,73,395	...	6,38,111	...	...	29,62,774
Italy . .	26,00,251	6,200	...	6,000	...	...	26,12,451
United Kingdom	3,03,204	1,24,766	26,656	15,11,311	...	1,867	19,67,147
Arabia . .	3,282	...	...	87,964	73,742	...	1,64,988
Straits Settlements . .	...	...	...	51,746	29,547	...	81,293
Aden . .	...	...	...	34,434	40,352	...	74,786
Mauritius . .	...	...	...	73,851	...	...	73,851
Turkey in Asia .	51,733	...	...	15,214	2,449	...	69,396
Persia . .	...	...	...	39,003	16,542	...	55,545
Other countries .	1,334	...	...	62,363	81,258	...	1,44,955
TOTAL .	44,10,415	10,04,361	26,656	25,19,997	2,43,890	1,867	82,07,186

SILK and SILK WORMS.

The family of **Saturnidæ** comprises eleven genera, under which are grouped nearly 400 species, all of which are silk-spinners. The eleven genera may be noticed in alphabetcal order :—

I. ACTIAS,

Includes five species known in India.

233 **A. ignescens,** *Moore.*

Andaman Isles.

234 **A. leto,** *Doubleday.*

Inhabits Sikkim, Khásia Hills and Sibsagor.

235 **A. mœnas,** *Doubleday.*

Sikkim and Khasia Hills.

236 **A. selene** (*McLeay.*)

Inhabits Mussouri, Sikkim on the north; Khásia Hills, Shillong Sylhet and Sibsagar on the east, and Madras on the south. Feeds on the following trees :—

1st.—Coriaria nepalensis, *Wall.*

A shrub of the Himalaya, found from Murree to Bhutan and in Sikkim.

2nd.—Juglans regia, *Linn.*

THE WALNUT.

Vern.—*Akhrot,* HIND., BENG.; *Kowal,* LEPCHA.

Wild in the north-west and Sikkim Himalaya, often also cultivated.

3rd.—Odina wodier, *Roxb.*

Vern.—*Jiyal,* BENG; *Kashmala,* HIND.; *Gampina,* TEL.

A deciduous tree met with throughout the hotter parts of India, and along the foot of the Himalaya to Assam, Burma and the Andamans.

4th.—Pieris ovalifolia *D. Don.*

Vern.—*Ayar,* HIND.; *Anjir,* NEPAL; *Piasay,* BHUTAN; *Kangshior,* LEPCHA.

A tree or shrub common in the Khásia Mountains and in the Himalaya from Bhutan to Kashmir, also in British Burma.

5th. Prunus Cerasus, *Linn.*

THE WILD CHERRY.

Cultivated in the North-West Himalaya.

237 **A. sinensis,** *Walker.*

Found up to now in North China.

II. ANTHERÆA.

Antheræa. A genus of silk-worm moths belonging to the sub-order **Heterocera,** of which the most valuable are the **Tusser, Munga** and **Mezankuri.**

The following enumeration of the Indian Economic species belonging to this genus has, in substance, been taken from **Mr. Moore's** brief classification, published in **Mr. T. Wardle's** *Hand-Book of the Wild Silks of India.* It will be found to indicate the chief regions where the more important Tusser silk-worms are met with.

SILK and SILK WORMS.

Antheræa andamana, *Moore,* HETEROCERA. 238

An allied species to the common **Tusser,** inhabiting the South Andaman Island.

A. assama, *Helfer.* 239

The *Múnga* of Assam, also found in Sikkim; in Assam it is extensively cultivated, often in a state of domestication, although the insect produces the best silk when reared upon the trees in the jungles in a semi-wild condition. A considerable export trade exists from Assam in Múnga silk-yarn.

A. frithii, *Moore.* 240

A common species, found in the hot valleys below Darjeeling, and to a certain extent along the outer ranges of the Himalaya, ascending to 2,000 feet, also in Sikkim. The fibre is reported as finer than that obtained from the ordinary **Tusser.**

A. helferii, *Moore.* 241

Met with along with **A. Frithii** in the sub-tropical East Himalayan valleys.

A. mezankuri, *Moore.* 242

This yields the *Mesankuri* silk of Assam, a fibre nearly white, and valued at about 50 per cent. above that of *Múnga.*

Specimens of the cocoons, of the silk yarns and fabrics prepared from this insect should be procured from Assam; also all available information. The worm feeds upon **Tetranthera polantha** *Wall,* the *Mesankuri* of Assam. It is stated to be abundant.

A. mylitta, *Drury.* 243

The *Tusser* silk-worm. This well-known and valuable insect seems to be met with throughout the low hills of the central plateau of India.

A. nebulosa, *Hulton.* 244

This worm is reported to be met with in the jungles of Colong, Singbhum and Chutia Nagpur.

A. perrottei, *Guér. Mén.* 245

A silk-worm, said to be a native of Pondicherry, reported to produce four broods a year.

A. roylei, *Moore.* 246

This is the oak-feeding silk-worm of the North-West Himalaya (Simla, Masuri, Almora, &c.); also found in Sikkim. The cocoon is large and very tough; but as it is reared successfully in houses, it is regarded as capable of improvement and development.

A. siwalika, *Moore.* 247

This is the Tusser worm met with on the submontane districts of the Punjab. This species feeds upon the **Zizyphus Jujuba** (*ber* or *beri*), and is found plentiful in Hoshiarpur District.

Antheræa assama, *Helfer.* [240]

THE MUNGA SILK-WORM.

Vern.—*Múnga, múga,* Ass.

This insect is met with chiefly in Assam, extending east to the Naga hills and the mountains of North Burma, including Silhet and Cachar, and extending south to Tipperah. In Cachar and the Naga hills I am not aware that the cocoons are even collected, although, in some districts, they are quite plentiful. In his *Hand-Book of the Indian Wild Silks*, **Mr. Wardle** gives a map of the Múnga silk, showing it to be found, in addition to the above localities, far away to the west in Dehra Dún, and across the Peninsula at Dhurrumpur in the Bombay Presidency. This is apparently founded upon a remark made by **Mr. Geoghegan** that it is met sparingly at Dehra Dún; but in the text of his work **Mr. Wardle** makes no mention of these localities. It would be exceedingly interesting to know if the insect is actually met with so far away from Assam, and to what extent. Specimens of the cocoons, yarn and fabrics, along with information, would be most interesting from the Dún and from Dhurrumpur.

This insect is, to a certain extent, domesticated in Assam, being reared in houses, but it is found to produce better and more productive cocoons when let go wild on the trees around the cultivator's house. It is stated to have five broods a year. The breeders of Upper Assam annually import their seed cocoons from Kamrup, all attempts to successfully perpetuate the species in domestication having failed. Breeding cocoons cost Rs. 2 per thousand.

The worm is described by **Dr. Brandis** (*Indian Forester, Vol. V, p. 35*) and by **Mr. Hugon** and other authors as feeding in Assam upon the following trees:—

1st.—Cinnamomum obtusifolium, *Nees.*

Ram-tezpat, BENG.; *Patichanda,* ASS.

A large, evergreen tree of the outer Himalaya, ascending to altitude 7,000 feet. The Múnga silk-worm sometimes feeds upon the leaves of this tree.

2nd.—Cylicopodaphne nitida, *Meissn.*

Kotoloah, ASS.

A large tree of East Bengal, Assam and Burma, on the leaves of which the Múnga silk-worm sometimes feeds. This is most probably the *Kontooloa* referred to by **Hugon.**

3rd.—Michelia Champaca, *Linn.*

Champa, or *Champaca,* BENG.; *Titasappa,* ASS.; *Oulia champ,* NEP.

A tall, evergreen tree, with large, yellow, strongly-scented flowers. Cultivated throughout India, wild in Nepal, Bengal and Assam.

Captain Jenkins says the Múnga silk-worm feeds upon this tree, but I am inclined to think there is some mistake regarding this statement, the species found upon the *Champa* being most probably quite distinct from the ordinary Múnga.

4th.—Machilus odoratissima, *Nees.*

Soom, ASS.; *Kawala,* HIND.; *Dingpingwait,* KHASIA.

A large tree of the Eastern Himalaya ascending to altitude 8,000 feet; common in Assam and the Khásia hills.

This is the chief plant upon which the Múnga silk-worm feeds. It grows gregariously, forming forests, and is often cultivated around villages to feed the domesticated worm, for, in some parts of Assam, the Munga may be said to be in a state of domestication.

5th.—Symplocos grandiflora, *Wall.*

Bumroti, ASS.; *Moat soom,* PHEKIAL.

A handsome tree or large bush which **Mr. Mann** says is sometimes used to feed the Múnga silk-worm. Two other members of this genus,

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are used to feed the small yellow silk-worms (Eria), *viz.*, **S. cratœgoides**, *Ham.*, and **S. ramosissima**, *Wall.* Could it be possible that Mr. Mann mistook large Eria worms for the Munga for it would seem unlikely to find the Munga feeding upon anything but laurels.

6th.—Tetranthera glauca, *Wall.*

Diglotti, ASS.; *Sempat*, NEPAL; *Diglilati*, MECHI.

An evergreen tree of the Eastern Himalaya and East Bengal, upon the leaves of which the Múga or Múnga silk-worms are sometimes fed.

7th.—Tetranthera monopetala, *Roxb.*

Sualu, ASS.; *Haura*, CACHAR; *Bolbek*, GARO.; *Meda, gwa, singraf, marda, kerauli, patoia*, HIND.; *Mendah, kari, leja*, GONDI.

A moderate-sized tree of the Sub-Himalaya, extending from the Ravi eastward to Bengal and Burma, and south to Central and South India. Upon the aromatic leaves of this plant the Múga silk-worm is stated to feed in Assam.

8th.—Tetranthera polyantha, *Wall.*

Adakuri, edenkuri, mezenkuri, ASS.; *Siltimber*, NEPAL; *Terhilsok*, LEPCHA.

A small tree of the Eastern Himalaya, Assam and the Khásia hills. In Assam the leaves are largely used to feed the Múga silk-worm; in fact, this tree is next in importance to the *Soom* for this purpose.

Dr. Brandis makes no mention of the Champa tree being used in Assam to feed the Múga worm, while **Captain** (the late Genera **Jenkins** says: "The silk produced from the worm feeding upon this planl) gives the finest and whitest silk, used only by the Rajah and great peotple, and is called *Champa-pattea Múnga.* The thread is sold at from Rs. 11 to 12 a seer. With the exception of this plant and the species of **Symplocos** referred to above, the Múga silk-worm seems to feed entirely upon species of Laurel. This is a most remarkable fact, of itself circumscribing the home of the Múnga worm, and removing it in a marked degree from all the other silk-worm moths. One can hardly imagine a creature, displaying so decided a preference for dry, evergreen, aromatic leaves, taking to any other kind of food, and there would, from this fact alone, seem some doubt regarding the Champa tree as a source of food for the Múnga worm. Information from Assam should be obtained, as also specimens both of worm and cocoon feeding on the Champa. The former should be preserved in small bottles or tubes amongst a little spirits of wine, or simply brandy and water. There is every probability that the Champa-feeding worm (if such exists) is a perfectly distinct species, and as it is reported to yield the finest Múnga silk, it seems highly desirable that special attention should be given to this subject. It is the more probable that this shall be found a correct conjecture, since up to within a few years the **Antheræa mezankuri** was supposed to be the same species as the common Múnga. **Mr. Hugon** places the Champa-reared Múnga on a par with the Mezankuri, and regards both as 50 per cent. finer than the ordinary Múnga.

THE MUNGA SILK-WORM.

On being hatched this caterpillar is composed of alternate black and yellow rings, but as it grows older the black bands are reduced to black spots or moles in regular lines, on each of the twelve rings which form the body. As it matures the colours change still further, the main colour becoming light greenish-yellow, with brilliant red moles, each having a gold edge around it and four sharp prickles and a few black hairs. When full

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grown it is about four inches long. The eggs are hatched in 10 days, the moth remaining within the cocoon for 16 to 20 days.

THE COCOON.

Is fawn-coloured, large and thin, devoid of the curious suspensor so characteristic of the Tusser cocoon. The short period of lethargy does not necessitate so much care in the construction nor protection of the cocoon as is displayed by the instinct of the Tusser worm.

THE FIBRE.

The soft loose fibre from the inner part of the Muga Cocoon is "thrown," in Assam, into a simple kind of yarn, and in this condition it is largely exported. The fabrics made from it are worn by the middle class, the Eria silk fabrics by the poor. The outer fibre is about $\frac{1}{1480}$ inch in diameter, and bears a strain of 2¼ drams, while the inner fibre is $\frac{1}{1080}$, and will support 3 drams. The tension of the outer fibres is about one inch to the foot, while the inner fibre is about* 1¾ inches. The fibre is not only much finer than the Tusser silk, but it is round, like that obtained from the mulberry-fed worms. It will show the difference between the Munga and Tusser silks to give here the measurements of the latter so as to allow of comparison:—

From edge to edge of the Tusser fibre, **Mr. Wardle** says, the diameter is $\frac{1}{770}$th part of an inch taken from the outer fibres, and from the inner fibres $\frac{1}{710}$; the former bear a strain of 7 drams, while the fine and uniform fibres from the inner layer of the cocoon bear as much as 8 drams. The thickness of the Tusser fibre is about $\frac{1}{1900}$ part of an inch.

The mullberry silk-worm of Bengal produces a fibre $\frac{1}{2000}$ part of an inch in diameter for its outer fibres and $\frac{1}{2200}$ for its inner.

[244] **Antheræa mylitta,** *Drury.*

THE TUSSER SILK MOTH, *Eng.;* TUSSORE, *Fr.;* BOMBYX SEIDE, *Germ.*

Vern.—*Tasar* or *bughy* and *jarvo tasar,* BIRBHUM; *Chattisghari tasar* SANTHAL PARGANAS; *Guti tasar,* BANKURA; *Dasa, daba, ampath ampatia tasar,* MANBHUM; *Jarú* (described by **Buchanan** and **Hamilton** in the districts of Bhagulpore and Dinagepore), BENG.; *Katkura* or *tussar, kutkuri konkuri mung, gori, deomunga,* ASS.; *Tusuru,* HIND.; *Kolissura,* DEC.

The Tusser silk-worm is, perhaps, the most abundant, as it is the most important, of the so-called Indian wild silks. It seems to occur in a wild state in the forests of the lower undulations of the plains of India, but is apparently absent from North India, Burma and Ceylon. I found it occasional in the lower and hotter forests of Manipur, often ascending to 2,000 feet in altitude. This fact extends the apparent eastern line of habitat of the insect to the mountain slopes of North Burma.

Mr. Hugon regarded the insect called in Bengal *Bughy,* which is met with feeding upon the *Bér* (**Zizyphus**), to be a different species from the *Jarvo,* found on the *Asan* (**Terminalia**), but **Moore** and other Entomologists think this is not the case. As Economic products, however, they differ considerably from each other, and the worm is of a different colour. If not distinct species, these forms illustrate, in a marked degree, the effect of different food in changing many of the characters of an insect. The so-called Tusser of the Punjab is, however, a perfectly distinct species, which I have accordingly excluded from present consideration.

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* In page 58 of his Hand-book, **Mr. Wardle** gives the tension of the inner fibre as 1¾, and in his table at page 68 he shows it as only ¾ inch per foot.

SILK an
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WORMS

THE HOME OF THE TUSSER.

It may be said to be a denizen of the highland forests inhabited by the Santhal, the Kol, the Khond, and the Gond, extending west and south-west of the Gangetic alluvial basin. Commencing at Rajmehal the region of the Tusser silk-worm may be said to stretch away south through the Rajmehal and Kurackpore hills to the table-land of Chutia Nagpur, thence to the mountain tracts of Orissa, of the Central Provinces, and the Northern Circars to Haidarabad. Taking the westerly direction this region may be said to pass from Rajmehal and Bhagulpur, through Behar, to the Kaimor mountains and Bandelkhand, thence to the Central Provinces and Berar. Practically speaking, this region may be said to have the Ganges for its northern boundary and the Godavari for its southern, with the coast ranges from Midnapur in Orissa, to Ramgar in Haidarabad, as its south-eastern and the Narbada river and the Kaimor mountains as its north-western boundary. Of course the Tusser insect crosses these limitations to a certain extent, being met with on the north of the Ganges along the foot of the Himalaya from Nepal to Sikkim, Assam and the Khásia hills, the Naga hills and the Lushai country to Chittagong, the Sunderbuns, and, sparingly, in the neighbourhood of Calcutta. It also crosses the Godavari, extending into the mountains of the Madras Presidency, and is even reported as met with in Mysore. Beyond the region which has been defined however, it can only be said to occur to a small extent, and in a wild and neglected condition, for, with the exception of a small corner of the North-West Provinces at Mirzapur, the cocoons are not even collected. The name Tusser has unfortunately been applied to all fawn-coloured indigenous silks, and in the North-West Provinces at Mirzapur a mixed cotton and silk fabric bears that name. It is exceedingly doubtful therefore if the Tusser worm proper occurs anywhere beyond the region defined, and it is incorrect to regard it as met with throughout the entire Peninsula of India. **Mr. Wardle** gives a map of the region inhabited by the Tusser insect, colouring the whole of India, except Cashmir, Rajputana, Bhutan, Burma and Ceylon. This is quite a mistake. It seems, practically speaking, to be absent from the Punjab, Rajputana, the North-West Provinces and Oudh. It nowhere occurs upon the Himalaya proper, never ascending above 2,000 feet in altitude, and it rarely if ever exists on the alluvial plains, except where these are limited and confined by hilly undulations.

The centres of the Tusser silk trade in India may be given as follows:—

In Bengal.—Bankoora, Bishnapur, Bhaugulpore, Futwa, Gaya, and Nawada.

In the Central Provinces.—Raipore, Bilaspore, Sambulpore, Upper Godavari, Chanda, Bhundara, Nagpore, Balaghat, Seonee, Chhindwara and Betul.

In Berar and Haidarabad—Ellichpore, Kummeer, Warrungal and Bhudrachellum.

FOOD OF THE TUSSER.

The following are the principal trees upon which the Tusser caterpillar feeds:—

Anogeissus latifolia, *Wall.*

Vern.—*Dhâwa, dhâura, bakil,* HIND.; *Gôbra, dhokridan,* RAJPUTANA.

A common tree of the Tropical Himalayan forests, extending to Central South India. **Captain Brooke** mentions the wild wormsin the Seonee forests as being met with on this tree.

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Bombax malabaricum, *DC.*

Vern.—*Semul, shembal, semur, bouro,* HIND., BENG., ASS.; *Illavam,* TAM.; *Búrga, buraga,* TEL.

Mr. Hugon mentions this tree as being one of the chief trees in Assam upon which it feeds.

Careya arborea, *Roxb.*

Vern.—*Kumbi,* HIND.; *Komba,* BOM.; *Boktok,* LEPCHA; *Dambel,* GÁRO *Ayma,* TAM.

Carissa Carandas, *Linn.*

Vern.—*Karaunda, kurunda,* HIND.; *Kurumia,* BENG.; *Kalaka,* TAM.

Eugenia Jambolana, *Lam.*

Described by **Major Coussmaker** as being a good plant to feed this worm upon.

Ficus religiosa, *Linn.*

THE PEEPUL; *Aswát, asud,* BENG.

Mr. Gamble says the *gori* or *deomuga* silk-worm feeds upon this plant in Assam. I am unable to decide as to what insect is meant, but have guessed it to be the Tusser, but it may probably be **Bombyx religiosa,** *Helfer.*

Ficus retusa, *Linn.*

Vern.—*Kamrup, sir,* BENG.; *Jamu,* NEP.; *Situyok,* LEPCHA; *Yerra, juri,* TEL.; *Pilála,* KAN.; *Nyoungop,* BURM.

A large, elegant tree, often cultivated in India in avenues.

Lagerstrœmia indica, *Linn.*

Vern.—*Telinga-china,* HIND.; *Daiyeti,* SIND and PB.

A small bush, much cultivated in Indian gardens on account of its rose-pink flowers.

Lagerstrœmia parviflora, *Hook.*

Vern.—*Lendya, dhaura,* HIND.

A small tree or large bush, wild in Bengal, Central, and South India.

Ricinus communis, *Linn.*

Vern.—*Rand, arund, arendi,* HIND.

Shorea robusta, *Gaertn.*

Vern.—*Sál, sála, sálwa,* HIND.; *Koroh,* OUDH; *Gúgal,* TEL.

Mr. B. H. Hodgson (*Journal, Agri.-Horti. Society of India*) says the Tusser feeds chiefly upon this tree in the Mechi forests at the foot of the Sikkim Himalaya. **r. Helfer** mentions this same fact, and it is also reported to be the tree in Midnapur upon which the insect feeds.

Tectona grandis, *Linn.*

Vern.—*Ságun,* HIND.; *Tekku,* TAM.; *Kyum,* BURM.

Col. Sykes states that the *Kolisurra* (or Tusser) worm feeds upon this tree in the Deccan.

Terminalia Arjuna, *Bedd.*

Vern.—*Anjan, arjun,* HIND., BENG.; *Vella marda,* TAM.

Terminalia Catappa. *Linn.*

Vern.—*Badam,* BENG.; *Tari,* KAN.; *Vedam,*TAM.; *Catappa,* MAL.

Mr. Hugon mentions that the Tusser feeds largely in Assam upon this tree.

Terminalia tomentosa, *W. & A.*

Vern.—*Saj, seni, asan,* HIND.; *Piasal,* BENG.; *Amari,* ASS.

This is one of the most favoured Tusser trees.

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Zizyphus Jujuba, *Lam.*

Vern.—*Kúl*, HIND.; *Bér*, BENG.; *Bhór*, MAR.; *Blair*, BOM.

Captain Brooke, writing of the Tusser silk, in Seonee, states that it is not known to feed upon this tree, but in other parts of India it is reported as doing so.

Much has been written regarding the improvement of the Tusser Cocoon, and the question of food has naturally taken a first place in the controversy connected with this subject. **Lagerstrœmia indica** and **parviflora**, possessing the property of rapid growth, seemingly to luxuriate under severe pruning or plucking of the leaves, are unquestionably the most successful bushes for this purpose. The **Zizyphus** (or *Bér*) is also a favourite, and of the remainder perhaps **Shorea robusta** and **Terminalia tomentosa** are the most important.

In Bhagulpore **Dr. Buchanan** states that the tree chiefly used is the last mentioned, the worms being lifted within baskets on to the trees and changed from tree to tree as the leaves are consumed. They are only applied to the same tree once in two years.

CROPS OF THE TUSSER.

The Tusser silk-moth has, generally speaking, two crops a year, but instead of being bivoltine in its wild state, it is most probably quadrivoltine. The cocoons are purchased by the rearers in May and June from persons who collect them in the jungles. The larger ones are, generally speaking, females, and as much as 8 to 10 cowries are paid a piece for these, while the smaller or male cocoons only fetch 4 to 5 cowries.

The crops may be traced out as follows:—

1st Crop.—From the *Dhaba* or seed cocoons in Bhagulpore, the *Ariya* or *Ranwat* in Seonee, the insects emerge in June, eggs are produced, then worms, and by July these pass again into the chrysalis, coming out as perfect insects in three weeks, that is, in August. This is the first or *Bhadeli* crop, from Bhadon, August. The *Bhadeli* cocoons are not sold except to rearers. They are preserved, and from them a fresh supply of insects is obtained, the perforated cocoons being then sold at a low rate.

2nd Crop.—The *Bhadeli* insects lay their eggs, and in due course these hatch and worms are obtained which pass into chrysalis in September, the cocoon being mature in October, or in some districts, not until November. This is the second crop known as the *Kartic* or *Katkahi*, because it appears in the month of Kartik (October and November).

Captain Brooke, in his interesting account of the Tusser industry of Seolee in the Central Provinces, published by **Geoghegan**, describes another crop:—

3rd Crop.—In Nagpur seed-cocoons from the *Kartic* crop are reserved, and in due course these produce eggs, worms and a crop of cocoons which mature in January. This crop is accordingly known as the *Magh* or *Maghur*.

4th Crop.—**Captain Brooke** infers, and apparently correctly, that in its wild state the Tusser insect is quadrivoltine, the *Dhaba* or May seed-cocoons being obtained from the *Magh*, so that the *Dhaba* is really the fourth crop. Entomologists seem to regard the insect as *bivoltine*, and the reports from different parts of India are most conflicting. It is remarkable that so much confusion should exist regarding the life-history of so very important an economic insect. Our ignorance in this respect must be viewed as indicating the amount of interest taken in the development of the Tusser silk of India.

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As practised by the natives of India, the rearing of the Tusser cocoon crop occupies about five months a year, commencing from the bursting of *Dhaba* cocoons in June to the sale of the *Kartic* crop in the end of September or beginning of October. **Dr. Buchanan** enters into a discussion regarding the different modes of obtaining seed, the important facts of which agree with all other accounts. Wild cocoons are sometimes collected and sold to the reeler, but as a rule they are sold to the rearer. These are called *Dhaba*. The silk produced from this would, accordingly, be *Dhaba* silk, but that which finds its way into the hands of the weaver is chiefly the *Sarihan* silk, or that produced from the first and second crops above discussed. Should seed cocoons be preserved from the *Kartic* crop over till next May in place of fresh *Dhaba* seed, the silk produced from this source is known as *Langga*. So much has the insect deteriorated, by this temporary domestication however, that this class of silk is regarded as very inferior, from which fact it seems quite clear that the true success of the Tusser silk industry of the future lies in the fact that, unlike the mulberry and other domesticated worms, it is never likely to be visited with a plague, spreading ruin to the very foundations of the industry, such in fact as recently passed over the mulberry industry. Fresh silk seed is always procurable, and from our interminable forests this is ever likely to remain the case.

In Seonee **Captain Brooke** (*see Geoghegan, page 146*) reports that the insects are in a state of partial domestication, being tended in all their stages, the rearers depending upon the wild supply for their seed cocoons. The seed cocoons are placed in baskets which are generally, for this purpose, large and flat. The insects escape from the cocoons during night, and in some districts the males are allowed to fly away, in others all are confined together in a room. Whichever course is followed the males soon discover the females and perform their mission. In 15 or 20 hours after their escape from the cocoons, the females are picked up and placed in closed baskets ending in long, narrow mouths, carefully lined with fresh leaves. Sometimes earthen pots lined with leaves are preferred. In the course of a day the females commence to deposit their eggs, laying from 50 to 200 during the first three or four days of their brief existence, perishing in 8 or 10 days more.

THE EGGS.

The *Eggs* are small, white, flattened, oval bodies, deposited in masses often adhering together. They are biconvex, nine, if arranged in a row, measuring one inch. On the ninth day the eggs are hatched within the baskets above described.

THE WORM OR LARVA.

At first, when the worm escapes from the egg, it is so small that it can hardly be seen. It at once commences to eat the leaves lining the baskets; as the baskets are at this stage placed on the trees, the worm soon attacks the fresh leaves thus supplied, and rapidly increases in size. It moults five times, at intervals of from 5 to 8 days; commencing to construct its cocoon in about 36 to 40 days, after the date of hatching. When full grown it is about 4 inches in length, of a pale green colour, having 12 joints marked with reddish spots, and with a reddish yellow band running along either side. It is so heavy when mature that it is compelled to walk along the delicate twigs suspended from below by its feet. Birds and ants are its greatest enemies.

SUPERSTITION REGARDING THE WORMS.

Throughout India a strict and severe superstitious observance is preserved from the period of hatching until the cocoons are collected. The men engaged in this trade lead lives of the strictest abstinence during this period, and so distasteful is the necessity for this observance, that, as compared with other industries, silk labours under a considerable disadvantage. It is remarkable that this religious observance is not confined to *one* race of men, nor to any particular religious community, nor, indeed, is it restricted to a particular species or class of insects. It seems universal. In the month of April, while in Manipur during the Burma-Manipur Expedition, I expressed a wish to see the process of domestication adopted in that State. I was accidentally near a silk-cultivating village at the time. I was shown the worm and cocoon on condition that I would not approach the house. I took my seat upon a wall near by, and they were brought to me. A woman also came and showed me the process of reeling. News of this fact spread to the Maharajah and his Durbar in great alarm asked me to on no condition make even the most accidental enquiry regarding the worms, in case, as had happened on a former occasion, they should take revenge of the intrusion and die off, to the ruin of a large population of cultivators. An edict preceded my every movement, prohibiting with severe penalty, any person from showing me the worms on the cocoons or answering even questions I should address to them on the subject of silk.

Dr. Buchanan accounts for the origin of these observances, as instituted to preserve a monopoly in the hands of a certain community, who took pains to make every one else believe that they and they alone could successfully rear the insect. **Mr. Baden-Powell** describes in his *Punjab Products* the successful introduction near Amritsur of the mulberry silk worm by Jafir Ali, a Kashmiri. That gentleman, to preserve a monopoly, adopted at once the practices of the professional silk-worm rearers. He would allow no one, not even his sons, to approach the worms in case of the evil eye proving fatal to his crop. In most parts of India women are supposed by the silk cultivators to be unclean, and are accordingly not allowed to see the worms, and the men who tend on these will not approach a woman in case of being defiled. In Manipur, however, I found women busily reeling the cocoons and tending the worms at the same time.

THE TUSSER COCOON.

During the long period the insect remains in the lethargic condition, it is absolutely necessary that the cocoons should be strongly and firmly attached. Were they loosely fixed to leaves, as with many other species of silk-worm, in the course of a few months, the leaves being caducous, the cocoons would be precipitated to the ground, where, of necessity, the creature would perish. But this is entirely prevented, for the Tusser worm not only spins a closely-woven and firmly-cemented cocoon of the appearance and consistence of the shell of an egg, but the cocoon is suspended by an elegant and ingenious cord from the twigs around which a strong loop is formed. This suspensor is generally about 3 inches in length, the loop being flattened on the top of the twig to a considerable extent, so as to make the suspended cocoon less likely to be dashed backward and forward. In fact, it soon becomes so firm that the cocoons remain suspended rigidly from the often leafless twigs like so many fruits.

The cocoon itself is almost perfectly oval, smooth, of a grey colour, with darker veins reticulating across its outer surface. The largest are about 2 inches long and 1¼ broad, the average size about 1⅝ inches long. The inner layer of fibre is quite loose, forming a soft cushion for the insect within. For

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a long time this layer was all that could be utilised as a silk fibre, but recent modes of separating or decomposing the cement has rendered it possible to utilise almost the entire shell. **Major Coussmaker** has paid special attention to the subject of the cement by which the Tusser worm consolidates its cocoon, and he has been able to arrive at an interesting conclusion, namely, that this substance consists of the excrements from the alimentary canal, and that its nature and colouring or injurious power, greatly depends upon the food upon which the worm has been fed. He is of opinion, consequently, that judicious feeding will greatly lessen this difficulty, by altering the nature of the cement. The silk, of which the pedicel or suspensor is composed, as also the outer shell, is of a reddish colour, and is built up of short broken fibres firmly cemented together. The inner layer is much finer, and entire.

"Each species of silk-worker has two stores of silk, one on each side of the alimentary canal, and below its mouth it has two so-called spinorates or orifices, through which the silk issues simultaneously in fine parallel filaments. As the silk is drawn out of these stores, the worm coats it with a varnish technically called "gum," which contains a brownish-yellow colouring matter.

"The Tusser worm, in spinning its cocoon, takes short sweeps of its head from side to side, depositing the silk very closely in parallel fibres, which take a zigzag course round the cocoon as he does so. It has been thought that the worm twists or spins the silk as it exudes it, but this is not the case. Besides the gum which coats the silk, the worm secretes at intervals a cementing fluid, which it kneads by an expanding motion of its body through the whole cocoon to consolidate and harden it. This cement gives to the cocoon its drab colour." (*Wardle.*)

When about to spin its cocoon the worm, as if to screen itself, first binds together a few leaves within which it commences its operations. The cord or suspensor is next prepared. The cocoon is then proceeded with, and at first it is so transparent that the entire movements of the creature may be carefully studied. By-and-bye it becomes quite opaque through the coatings of cement with which it binds the threads together, and in the course of a few days it is perfectly hard. It requires in all 15 days to construct its cocoon.

The hard outer layer or cocoon shells of this moth are now largely carded and spun into Tusser silk, but from almost time immemorial, they have been used for the formation of strong bands or strings, by being carefully clipped off round and round. These straps the natives regard so strong as to resist both fire and water; they were formerly, and are even still, used in the Deccan to fasten the barrels of matchlocks to their stocks.

In Bengal the Tusser cocoon is, perhaps, most plentiful in the district of Bhagulpore, having in former days been there made into coarse cloth used by the poorer classes. In Assam, at the present day, a similar coarse cloth is even now regarded as fit only for the very poorest, the *Erya* silk being so very plentiful that the poor can afford to be clothed in silk garments.

From almost time immemorial the Erya silk cocoons have been carded and spun in Assam, but it is within the past few years that it has been found possible, as above stated, to treat the Tusser cocoons in this way.

THE PERFECT INSECT.

The *escape of the perfect insect* from the cocoon is caused through its secreting a fluid which softens the cement on a spot on the apex of the cocoon. It is quite a mistake to think that it eats its way through. It has no mouth, properly so speaking, and certainly nothing by which it

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could cut the cocoon. When softened the insect simply forces its escape by displacing the fibres.

On escaping from the cocoon it discharges its duty, the perpetuation of the species, during a brief existence of 10 or 12 days. It neither requires food nor is it provided by any process by which it could eat or digest food, hence, having accomplished its mission, it perishes.

NATIVE MODE OF REELING THE SILK.

In Bengal about 400 cocoons are placed in an iron pot along with 7½ seers of water, in which a small piece of potash has been dissolved. The bottom of the pot is protected by a small piece of mat, to save the cocoons from being burned. The cocoons are boiled for one hour. The alkaline water is then poured off and the cocoons transferred to a clean pot, where they are left standing over for three days, exposed to the sun, a thin cloth being tied over the mouth of the pot to prevent them being soiled by dust or birds and insects. On the fourth day they are again boiled with 2½ seers of water for about an hour, and thereafter poured into a basket where they are allowed to cool. They are then washed with cold water and spread out upon a floor of cow dung ashes to dry, a cloth being stretched across to keep them clean. In six hours they are ready to be reeled, but should experience show that some are still not ready, these are carefully picked out and exposed for a longer period to the action of the sun.

Each cocoon is now carefully picked, by the hand, so as to remove the waste outer shell known as *jhurí*. This substance is sold at a small rate to potters to make the brushes with which they apply the pigments to their wares. The outer continuous fibre of each cocoon is then sought with the hand and those from 5 to 10 cocoons (according to thickness of required thread) are twisted together by being rubbed across the left thigh. The thread thus formed is wound upon a crude spindle, which is twirled in one hand while the fibres are twisted by being rubbed upon the thigh with the other. While being reeled the Tusser cocoons are not placed in hot water, but are left quite dry dancing about in a basket. The first or finest thread removed in this way is called *lak*. After the removal of the *lak* there remains a coarser thread which is next reeled. This is known by the same name as the waste, namely, *jhurí*. This coarser thread is sold to men who prepare silk strings. The perforated cocoons are also reeled, but they bring a much lower price, because the fibre has to be so often joined that the thread is very inferior.

Working in this way a woman will boil, dry, and reel about one rupee's or 400 cocoons in 10 days, or 1,200 a month. These will yield about 2,247 lbs. of fine thread (*lak*) worth Rs. 5-6 and 1½ annas of *jhurí*. The cost of pots and firewood leave a profit of Rs. 1-8 to Re. 1-12 per mensem. (*Dr. Buchanan.*)

ITALIAN AND FRENCH MODE OF REELING.

In principle this is identical with that described as practised by the natives of India, namely, the extraction or uncoiling of the natural fibre from the cocoon (each of which, as prepared by the insect, is composed of two filaments), the fibres from a required number of cocoons being wound together and slightly twisted into a thread known as a "single." In practice, it is very different however. The fibre is cleansed of all its impurities, which, by the native process, are left adhering to it. A fixed and definite number of fibres are wound together into the "single," which is of uniform thickness, and much finer than can be produced by the natives of India. In other words, the one produces a careless or accidental thread, and the other an accurate and definite one. A skein of 1,000 yards in length of the ordinary native-reeled "single" weighs from 9 to 15 drams, technically known as 152 to 255 "deniers". From Tusser cocoons reeled by the Italian process **Mr. Wardle** obtained a size of 51 deniers or 3 drams per 1,000 yards. The Tusser fibre is about $\frac{1}{70}$ part of an inch, or three times as thick as ordinary silk, so that 51 deniers would, for such a fibre, be regarded as a good practicable result. The denier is equal to about 0·825 grains.

The cocoons are boiled for a considerable time in an alkaline solution, to which some glycerine may be added. After being boiled they are conveyed to a basin over which a semi-rotating brush is so adjusted as to brush off the outer waste shell and ultimately pick out the continuous threads. When these have been found the cocoons are transferred to the reeler. A number of cocoons, with the ends of their found fibres twisted together, are placed in the hot-water basin of the reeling machine; four or five of these are passed through the agate centre guides and the croiseur, and are thus cleansed, and to a required extent twisted, before being conveyed to the reel. The reel is driven by a handle or windlass, and the connection between the fly wheel and the reel is such that the reeler may stop the action at any moment, having a lever near by which throws the reel out of gear, should any necessity arise for stopping the machine. The moment a thread breaks, or whenever a cocoon is reeled out, the end of a fresh one is quickly presented and the action continued.

Prepared by this mode the thread is cleaner and devoid of smell; it takes colour more rapidly, and without requiring to be bleached, the lighter shades of colours may be given to the silk.

The Italian-reeled fibre, the primary thread, or "single," produced by reeling, has now to go through the process technically known as "throwing." Two or more "singles" are "thrown" together, and spun or twisted into a yarn. For many years English spinners could only produce the "tram" or weft required by the silk-weavers. The finer and more delicate "organism" or warp had to be imported from Italy and France. John Lombe of Derby managed to become possessed of the secret however, and from that date it spread rapidly over the world. The tram or weft yarns are composed of two or more singles, only slightly twisted together, being left loose and open so as to cover more freely the warp. Warps are rarely composed of more than two singles, and for fine warps a "single" alone is used. It is much more difficult therefore to produce the warp which has to go through six processes, *viz.*, winding, cleaning, spinning, doubling, spinning and reeling; the warp has 8 turns in the inch, weft only 4. Reeling is as a rule performed by quite a distinct person from the spinner, and the singles reach the latter firmly twisted into "knots" and tied up in batches known as "books." The Italian-reeled tusser is as pure as ordinary silk, and only loses two ounces a lb. on being dyed, while native-reeled tusser loses as much as seven and never less than five ounces a lb. That is to say, the European reeled yarn loses 12½ as compared to 37½ per cent. The books of thrown silk, as they reach the weaver, are known as "hard yarn." For most fabrics they have to be softened by being boiled, a process which brings out the brilliancy of the fibre as well as softens the yarn. By the process of softening native yarns lose seriously in weight, and thus not only are native-reeled singles and thrown yarns unsuited for the majority of European purposes, but on being purified they lose so seriously as of necessity to cause their commercial value to be considerably below that of European reeled and thrown silks. So great are these disadvantages that the future of Tusser silk depends more upon the efforts put forth to improve the reeling than upon improvements in the breed of the insect. There is not the slightest reason why, with cheap Indian labour, could improved reeling be introduced, India might render the exportation of raw cocoons a thing of the past.

THE TUSSER SILK FIBRE.

Mr. Thomas Wardle, in his interesting *Hand-Book on the Wild Silks of India*, states that "there is a striking peculiarity about the fibre of Tusser silk. I have carefully and thoroughly examined it many times under the microscope, and find undoubtedly that it is almost flat and not round, as is the case with the silk produced by the mulberry-fed worm. There is no doubt that it is to this property that Tusser silk owes its glossy or vitreous look, reflecting a little glare of light from the angle of incidence on its flat surface, whilst the mulberry-silk fibre, being round, reflects the light in all directions. By some this property is considered a drawback, but by the time the fibre has become modified and the flatness diffused in the loom, I think the lustre of the cloth is enhanced by it. This tape-like appearance gives the fibre this disadvantage, that it is less homogeneous than the round fibre of the mulberry-silk, and I find an undoubted tendency in it to split up into smaller fibrets, of which the fibre is evidently composed, causing the silk to swell out when subjected to severe dyeing processes, particularly the bleaching one of recent date, thus giving a substantial and important reason why its coloured cements should be removed."

English and Italian improvements in the *reeling and spinning* of the Tusser cocoon have produced, within the past few years, a complete revolution in the European demand for this common Indian insect. While experiments to improve the rearing, and, if possible, to domesticate the worm, have, in India, failed financially, when compared with the success and enormous development of the introduced mulberry worm, there seems every probability that a reaction will at an early date commence. The demand for Tusser cocoons and Tusser silk seems likely to become each year more urgent. A careful perusal of **Mr. Wardle's** most interesting *Hand-Book* forces upon one the conviction that, since recent discoveries render it possible to spin even the waste particles rejected from the reeling, every fibre of the cocoon being now utilised, a great future is certain to immediately open out for this, one of our most common and most plentiful wild economic products. It is absolutely necessary to impress upon the people of India the distinction between reeled Tusser silk and spun Tusser silk. By the former the cocoons, after being boiled in an alkaline solution, have the original thread drawn out from the interior, a process which could only be carried to a certain extent, all experiments having failed to soften the cement so as to allow of the entire cocoon being reeled. Indeed, even were it possible economically to soften the cement entirely, a large proportion of the outer shell could not be reeled owing to its being composed of broken or short threads. By the Indian, and indeed by the old European, mode of reeling the Tusser cocoon, about one ℔. of reeled silk was all that could be prepared from 11 ℔s. of the cocoons; the remaining 10 ℔s. were technically known as tusser-silk-waste. **Mr. Wardle** says that a few years ago this tusser-waste was valueless and lay about our English ports, for some time, quite unsaleable. It now is greedily bought up for 2*s*. a ℔. This is due to the fact that these waste cocoons can be carded and spun into thread like other fibres, instead of being reeled; thus not only utilizing the waste but opening up a complete new silk industry, of spun and carded silk fabrics. From these spun silks many new fabrics, which are rapidly gaining public favour, have come into existence, of which the following may be mentioned:—

THE EUROPEAN MANUFACTURES OF TUSSER SILK.

1st—Imitation seal-skin cloth. The use of this fabric for cloaks and mantles for winter wear has already commanded a regular and established place in the market. The Tusser spun thread for this purpose has

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a much closer resemblance to the true seal-skin than could be produced from any known species of reeled silk, and it is, moreover, much more durable.

2nd—Tusser spun yarn also bids fair to become an important substitute in the manufacture of **Utrecht velvet.**

3rd.—It promises to become extensively used in **carpet manufacture,** excelling all other silks in possessing rigidity, a quality indispensible in a carpet fibre. The brilliancy with which the silk-coloured threads enliven carpets and other mixed fabrics seems certain to give birth to a totally new and unlimited industry.

Mr. Wardle, from whom the above information regarding the manufactures of the Tusser has been derived, urges the absolute necessity of pressing upon the people of India this new discovery, with the view of encouraging them to preserve the vast quantities of cocoon waste, the supply of which in Europe will be the only impediment to the development of this new industry. China is already alive to this position, and at present the waste and perforated cocoons used in the spinning trade are chiefly imported into Europe from that country.

Reeled Tusser silk has also undergone immense improvements, and is largely made into silk fringes and into the woollen cloths known as **grenadine or mandarin.** It may be stated that this new impulse to the Tusser trade took its birth from the Paris Exhibition, where these facts were first made known. The average London consumption for the four years ending 1877 was 238 bales, for 1878 (the year of the Paris Exhibition) it became 736 bales, while in 1879 the consumption was increased to 1,142 bales.

Amongst the silks of commerce Tusser occupies perhaps the least important position, but this is due to two causes, one of which has now been fully discussed, namely, that one maund of cocoons of tusser would yield about 4 seers of silk-reeled fibre or $\frac{1}{10}$th of the weight, while the mulberry cocoon would give almost half its own weight of fibre. This difficulty has now been removed. The worm is wild; it occurs abundantly throughout the vast Peninsula of India. While the entire weight cannot be reeled every particle of the cocoon can be utilised. The second great difficulty to the development of the Indian silk trade is the imperfect and faulty system of reeling. This fact is at once established by the published figures of the sales of Tusser-reeled fibre, the Italian or improved fibre obtaining 3 or 4 times the price of the ordinary native-reeled silk. What seems wanted therefore is to introduce the Italian process of reeling the cocoon, and to instruct the natives to carefully preserve the waste or outer shell, when there cannot be a doubt, the wild Tusser industry could compete favourably with the introduced mulberry-worm. It would certainly afford a remunerative employment for the vast population of our lower hilly undulations, who, by nature, are opposed to agricultural labour, and who are driven out of the silk market through their lowland neighbours having taken to rearing the domesticated mulberry silk-worm as an auxiliary to their other employments.

DYEING AND BLEACHING OF TUSSER SILK.

It was for long thought that an utterly insurmountable obstacle existed to the development of the Tusser silk trade in the difficulty experienced in causing the fibre to take the lighter shades of colour. That is to say, it was thought impossible to bleach the fibre so as to fit it to take the lighter shades of colour. Within the past few years, however, this has been so far overcome that time may be stated to be all that is required to secure complete success, allowing of the development of scientific principles which have already been recognised as having vanquished the difficulty of bleaching. There are two widely different modes by which this most

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desirable object has been accomplished. Allusion has already been made to **Major Coussmaker's** discovery regarding the matter voided by the insect during the construction of its cocoon. This was stated to constitute the cement used by the worm in consolidating its cocoon, and to be the substance which imparted the objectionable colour to the fibre. Systems of improved feeding was stated to greatly alter the nature of the excrements, and so completely has **Major Coussmaker** been able to carry out this idea that he has produced cocoons perfectly free from the objectionable colouring matter, the worm having been taught to void the injurious materials before constructing the cocoon. It is to be hoped that this proves a convenient and practicable process of rearing the insects, for it completely removes the chief obstacle to the Tusser silk. The natural cocoon has now, however, been found to be capable of bleaching or of parting with its colour whenever the fibre is brought into contact with nauseant oxygen. This was first discovered by **M. T. du Motay,** who used permanganate of potash for this purpose,—one of the most powerful oxidising bodies, upon organic matter. Unfortunately, however, this substance injures the fibre, but the re-action establishes a principle which will undoubtedly be applied successfully with some other re-agent. Binoxide of Barium, by simple contact with the fibre, accomplishes the same purpose, but it is expensive.

It is to be expected, however, that in a very short time an easy and simple mode of bleaching the cocoon may be discovered. Dyed with the deeper shades, or simply left in its natural colour, Tusser silk is rapidly assuming a recognised and established commercial position. It takes freely and easily to aniline dyes, which, while fleeting (*petit teint*), are brilliant and attractive, and for many purposes, where absolute fixity of colour is not a desideratum, they serve an important purpose. Many of the indigenous Indian vegetable dyes are, however, equally serviceable for Tusser silk, especially those which, like the aniline colours, cannot resist direct exposure to light. The following may be mentioned as the Indian dyes specially recommended for Tusser silk.

***1st.—Bixa Orellana,** *Linn.*

The Arnotto yields from the pulp around the seeds an excellent yellow dye, extensively used for Tusser silk, the colour being deepened into red when used in combination with **Mallotus philippinensis,** *Müll Arg.*

2nd.—Butea frondosa, *Roxb.*

The flowers (*tesu*) of this plant yield a pretty yellow dye, but it is fleeting.

3rd.—Carthamus tinctoria, *Linn.*

Safflower has been long valued on account of its beautiful red colour; it is one of the most extensively used dyes for Tusser and other silks in India.

***4th.—Delphinium saniculæfolium,** *Boiss.*

Vern.—*Asbarg, ghafis,* PB.

A herbaceous plant met with on the Himalaya, but largely imported from Afghanistan to Multan, where they are used along with *Akalbér* (**Datisca Cannabina**) and alum to produce a permanent yellow dye with silk. Silk is often dyed with *Asbarg* alone, being steeped in a solution prepared by boiling 31 lbs. of the dried flowers in 5 gallons of water. *Asbarg* with indigo produces the greens in which silks are often found dyed.

***5th.—Flemingia congesta,** *Roxb.*

This small, gregarious bush is common everywhere throughout the hotter damp forest of the lower hills, especially so in Chutia Nagpur and Central India. This is the plant which yields the *Warás* medicine of

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Africa. The hairs from the capsules and young flowering twigs of this plant yield an excellent brilliant orange dye, suitable for silk. Information of this dye-stuff has recently been obtained from Europe, but apparently the people of India are ignorant of this valuable dye.

***6th.—Lac, Cochineal** and **Indigo** dyes are also sometimes used for silk, the latter very rarely.

***7th.—Mallotus philippinensis,** *Müll.*

The powder obtained from the fruits known as *Kamela* or *Kama laguri* is one of the most frequent silk dyes in India, imparting a rich red, orange or yellow colour, and not requiring a mordant to fix it. The fruit dust is sometimes boiled in a weak solution of alum before the silk is immersed in the dye solution.

8th.—Nyctanthes Arbor-tristis, *Linn.*

The corolla tubes known in the bazars of India, by the name *harsinghar*. They impart a beautiful orange or golden dye, often used in combination with turmeric, when it is said to be less fleeting than when used alone.

9th.—Woodfordia floribunda, *Salis.*

The flowers of this plentiful bush (*Dawi*) give a red colour to silk.

I am conscious that the above brief enumeration of the dyes either used by the natives of India for Tusser silk or for other silks, and likely to prove serviceable for Tusser also, is exceedingly imperfect. I have placed an asterisk opposite the names of the dyes which are most used in silk-dyeing. The question of the extent to which Indian dyes are suitable for Tusser silk remains still to be solved, and I cannot help feeling that page 46, which treats of this subject, is the least valuable part of **Mr. Wardle's** most instructive and useful *Hand-Book*. I am not aware of the leaves of **Phyllanthus Emblica** yielding any kind of dye, although this stands third in **Mr. Wardle's** list. It is exceedingly doubtful if the seeds of **Cassia Tora** yield dye of any kind. They have been mentioned by one or two authors as being in Madras used along with indigo in certain processes of dyeing, the starch of the Cassia seeds apparently assisting the indigo. These illustrations from **Mr. Wardle's** *List of Indian Dyes* are referred to with the view of showing that while he has investigated the subject of Tusser silk with most untiring zeal and with great success, the whole question of the dyeing of this most useful fibre has still to be solved. It is probable that for some time to come the success which has attended the use of the aniline dyes must be left undisturbed, but it seems likely that an extensive and personal inquiry in India into the practices of Indian dyers would more rapidly discover the desired key to the proper dyeing of Tusser silk than years of experimenting with small quantities of dried and imperfectly identified dye-stuffs.

It is highly desirable that a concentrated inquiry throughout the entire Empire should, if possible, be made into the subject of Tusser silk, and especially into the modes of dyeing the fibre, so that at the forthcoming Calcutta International Exhibition we may be able to continue and develope the new interest which the Paris Exhibition started in this natural wild silk fibre. Specimens of the cocoons, perforated and unperforated, of the reeled fibre and yarns, as also of the woven fabrics should be obtained and so catalogued as to be kept quite distinct from the other species of silk. Descriptive accounts of the processes of reeling the fibre and specimens of the appliance used for this purpose would be most useful and interesting. Full descriptions of the processes of dyeing and specimens of the bazar dye-stuffs used, as also samples of yarn or fabrics dyed are most

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urgently required. We have at present only two specimens of dyed Tusser silk in our collections.

III. ATTACUS.

Includes nine species known as the Atlas and Eria Group, of which the most important is the *Eria* or *Arindi* :—

248 **A. atlas,** *Linn.*

Found in China, Burma India, Ceylon and Java. In India its habitat extends from Sylhet and Cachar to Sibsagor, Johore, Sikkim, Mussourie, and Almora. The cocoon is well stored with a fine silk.

The following are the trees on which this insect feeds.

1st.—Artemisia vulgaris, *Linn.*

Vern.—*Dona,* HIND., BENG. ; *Titapat,* NEPAL ; *Nagdana,* CACHAR.

A gregarious shrub in Sikkim Hills, also in Bengal and Assam.

2nd.—Phillanthus lanceolarius, *Mull.-Arg.*

A shrub on which the insect is said to feed in Mussourie.

3rd.—Excæcaria insignis, *Mull.-Arg.*

Vern.—*Khinna,* HIND. ; *Dudla,* PB.

A tree of the Sub-Himalayan tract, also found in Chittagong, Burma, and Western Ghás.

4th.—Celastoma malabathricum, *Linn.*

Vern.—*Choulisy,* NEPAL ; *Tungbram,* LEPCHA ; *Shapti,* MECHI ; *Lutki,* CACHAR ; *yetpyai,* BURM.

A large bush met with throughout India up to 6,000 feet in altitude chiefly near water-courses. The Atlas worm, when fed on the leaves of this tree, is said to give a very white silk.

5th.—Symplocos cratægoides, *Ham.*

Vern.—*Lood,* CACHAR ; *Lodh,* KUMAUN ; *Loja,* SUTLEJ ; *Loj,* PB.

A small tree inhabiting the Himalaya at an altitude from 3,000 to 8,000 feet, also Assam, Khásia and Martaban Hills.

249 **A. canningi,** *Hutton.*

North West Himalaya ; common in a wild state ; produces annually hard, compactly-woven cocoons of a rusty orange or grey colour. Feeds on the leaves of—

1st.—Coriaria nepalensis, *Wall.*

A shrub of the Himalaya from Murree to Bhutan, also in Sikkim.

2nd.—Xanthophyllum hostile (*See Hook. Vol. I, 209.*)

250 **A. cynthia,** *Drury.*

Inhabits the regions from Sylhet, Cachar and Shillong to Sibsagor, Sikkim, Mussourie and Simla ; also found in South Andaman.

251 **A. edwardsia,** *White.*

Sikkim, Cherra, Khásia Hills, and Mussourie.

SILK and SILK WORMS.

252 **A. guerini,** *Moore.*

Inhabits Eastern Bengal.

253 **A. lunula,** *Walker.*

Sylhet.

254 **A. obscurus,** *Butler.*

Occasionally found in Cachar; the worm feeds on a plant called in the vernacular *Lood.*

255 **A. ricini,** *Jones.*

Inhabits Assam and parts of Bengal, and extends from Darjeeling to Nepal, Kumaun and Ladak. It is the Eria of Assam and Arindi of Bengal, and a fuller account is given at the end of this enumeration of the species.

256 **A. silhetica,** *Helfer.*

Found in Sylhet and Sikkim.

A. ricini, *Jones.*

THE ERIA SILK-WORM.

Vern.—*Eria,* ASS.; *Arindi,* BENG.

The habitat of this worm has been given above. In Assam it is very common; and in Bengal it is found in certain quantities in the districts of Rungpur, Dinagepur, Bogra, Julpigori, Darjeeling, Chittagong, Gya, Shahabad, Purnea and Pooree.

It is reared by the natives in these parts in a state of semi-domestication; it is said to produce four crops. The female moth, says **Mr. T. Wardle,** lays her eggs round a twig; the twigs with the eggs on are sold in the markets, and are bought by rearers.

THE WORM.

The Eria worm, when full grown, is about 3½ inches long. It feeds on the leaves of the following plants and trees, and moults four times:—

1st. **Ailanthus excelsa,** *Roxb.*

Vern.—*Maharukh,* HIND., MAR.; *Peru,* TAM.; *Pedu,* TEL.; *Gormi-kawat,* URIYA.

A tree of North-West India, Behar and the Western Peninsula.

2nd. **Ailanthus glandulosa,** *Desf.*

A lofty tree often planted in Central and Southern India.

3rd. **Coriaria nepalensis,** *Wall.*

See account given above.

4th. **Ricinis communis,** *Linn.*

THE CASTOR OIL PLANT.

Vern.—*Arendi,* HIND.; *Bhairenda,* BENG.; *Aneru, harnauli,* PB.; *Indrendi,* KUMAUN; *Orer,* NEPAL.; *Raklop,* LEPCHA; *Sitamunuk,* TAM.; *Sitamindi,* TEL.; *Nerinda,* GOND; *Haralu,* KAN; *Kyeksu,* BURM.

Cultivated throughout India, usually for the oil which is expressed from the seeds; often found growing wild. The leaves ot this plant is the best suited and commonest food of the Eria worm.

SILK and SILK WORMS.

5th. Xanthoxylon hostile.

6th. Gmelina arborea, *Roxb.*

Vern.—*Gumhar,* HIND., BENG.; *Gomari,* ASS.; *Gumai,* CACHAR; *Bolkobak,* GARO; *Gumadi,* TAM.; *Gumar-tek,* TEL.; *Shewney,* KAN.; *Shewan,* MAR.; *Chiman,* BHIL; *Yamaney,* BURM.

A deciduous tree throughout India, and in the sub-Himalayan tract, also in Burma and Andaman Islands.

The following trees are also mentioned as being fed upon by the worm, *Birsonali, Hindograss, Koosool, Litta-pakori, Murkurdal, Okonni.*

THE COCOON.

The cocoon which the *Eria* worm forms is somewhat loose and flossy, orange red, sometimes white.

THE FIBRE.

Its thickness is $\frac{1}{1500}$ of an inch when taken on the outside of the cocoon, and $\frac{1}{1450}$ in the inner part. The average value of the fibre may be stated to be from 12 annas to one rupee per 2½ lbs. **Mr. T. Wardle** obtained, in 1879, through the Government of India, 70 lbs. of Eria Cocoons: he had them carded or dressed and spun, and reported that he knew of no silk better adapted for spinning. "The staple (*Mr. Wardle*) obtained from the first draft's operation is glossy, long, and very fine. Its fineness is owing to that of the ultimate fibre. It is about one-half finer than Tusser silk, although not more than two-thirds as fine as the Bengal mulberry-fed silk of **Bombyx mori** or silk of Commerce. The after or shorter drafts are also of much importance as showing the economising of the shorter fibres after the longer ones have been removed. These are used for less important manufactures than the long staple. Nothing is wasted in the modern mode of spinning. The yarns made of these fibres are of great regularity and fineness, proving this silk capable of uses for spinning and weaving purposes to an unlimited extent."

DYEING OF ERIA SILK.

Under this head also we must have recourse to **Mr. Wardle**, and relate in his own words the result of his careful, comprehensive experiments:—

"The dyeing of Eria silk much resembles the dyeing of Tusser. Whether owing to the flatness of its fibre, or to the nature of its sericine, it is far behind mulberry silk in its natural affinity for dye-stuffs. Heat and the media of mineral salts, however, are the principal agents in bringing the fibre into a dye-receiving subjection. * * * The dyeing baths have to be much stronger in tinctorial matter than those for mulberry silks. It follows, therefore, that there is an unavoidable increase in the cost of dyeing Eria silk, as is also the case in Tusser silk, and to about the same extent. Probably I shall not be far from accuracy in stating that Eria silk requires twice as much dye-stuff as mulberry silk, thereby causing the dyeing to cost considerably more. The Eria cocoons being of two kinds, some of them rust colour and others white, cannot be dyed into pale colours without bleaching, which again adds to the cost of dyeing. It bleaches very well with the bioxide of barium process, and takes excellent colours in pale tints afterwards.

SILK and SILK WORMS.

For dark shades bleaching is not necessary, nor would it be necessary for paler shades in silk spun from the white cocoons if they could be kept separate from the brown ones. * * * I have succeeded in imparting a variety of colours to this silk which leave little or nothing to be desired. As far as I can learn I believe this is the first time in Europe that Eria silk has been white."

THE ERIA SILK INDUSTRY IN INDIA.

As already mentioned, the production of Eria silk is confined chiefly to Assam and parts of Bengal. Certain inquiries made by the Government of India in 1879 furnished the broad result that in Bengal small supplies of the silk are at present worked up chiefly for home manufacture and use; and that in Assam only a few of the northern districts and the Jaintia Hills produce it in any appreciable quantities. But the general opinion of the local authorities was that production would be stimulated, if remunerative prices could be obtained, and an effective demand would lead to a large increase of production.

From the details of the reports of district officers concerned the following particulars may be noted:—

In Assam, about 54,000 lbs of Eria silk, in the raw state, unreeled, can be obtained annually from the districts of Kamrup, Darrang, Nowgong, and Lakhimpur, and about 30,000 lbs. from the Jaintia hills. In Goalpara and Sibsagar, the production of silk is carried on to a very limited extent, chiefly for home consumption. In Cachar the silk is worked up for their own use, by the hill tribes in almost every village of the hills in the northern parts of that district. From Sylhet no information has been furnished, but here, as well as throughout Assam, the necessary food of the Eria worm grows in abundance.

In Bengal, the Dinagepur district can supply about 13 maunds of Eria cocoons annually in the winter. In Rangpur about 30 to 35 maunds are produced, but it is difficult at present to obtain any supply, as the natives are unwilling to sell the cocoons; they prepare therefrom cloths for their own use. In the Bogra and Julpigori districts the silk is worked up for home consumption only, the quantity produced being about 18 maunds of cocoons in Bogra and 40 to 50 maunds of thread in Jalpiguri. In the Darjeeling Terai about 10 to 12 maunds of cocoons could be annually obtained. In the Chittagong district a small quantity of the silk is produced, and the thread is made into twine for fishing purposes and sold to the extent of Rs. 500 annually in the local bazars. In Purneah the worm is reared to a very small extent for the silk, which is used in home consumption only. In Gya the silk is worked in certain wild tracts. In Shahabad the quantity produced amounts annually to about 9,000 lbs. In Pooree the worm, though entirely neglected, is common, especially in the Khurda estate; and in this latter place if a demand arises a new useful industry could easily be opened to the natives.

IV.—CALIGULA.

257 1. **C. simla,** *Westwood.*

Simla, Kumaun, Mussoorie, and Khasia Hills; forms an open, net-like cocoon; feeds on—

1st.—Juglans regia.

See account given above.

2nd.—Pyrus communis, *Linn.*

THE COMMON PEAR.

Vern.—*Naspati, tang, sunkeiut,* PB.

Cultivated and somentimes wild in the North West Himalaya and Kashmir.

3rd.—Salix babylonica, *Linn.*

Vern.—*Bisa, bada,* PB.; *Giur,* KASHMIR; *Tissi,* NEPAL.

A tree commonly cultivated in North India.

C. cachara, *Moore.* 258

Cachar.

C. thibeta, *Westwood.* 259

North West Himalaya, Mussourie, and Sikkim; forms a light, open, net-like cocoon; feeds on the—

1st.—Cydonia vulgaris, *Pers.*

THE QUINCE.

Vern.—*Bihi,* HIND.; *Bamsunt,* KASHMIR.

Cultivated in North West India and up to 5,500 feet in the Himalaya.

2nd.—Pieris ovalifolia.

See account given above.

3rd.—Pyrus communis, *Linn.*

See account given above.

V.—CRICULA.

C. drepanoides, *Moore.* 260

Sikkim.

C. trifenestrata, *Helfer.* 261

Very common in Assam, where it is known as *Haumpotoni*; occurs in Moulmein; forms an open, net-like cocoon of a beautiful, rich yellow colour; feeds on the following trees:—

1st.—Machilus odoratissima, *Nees.*

Vern.—*Soom,* ASS.; *Dingpingwait,* KHASIA; *Phamlet,* LEPCHA; *Kawala,* NEPAL, HIND; *Dalchini,* PB.

A large tree of the outer Himalya, extending to the Khásia Hills, Assam and Burma.

2nd.—Anacardium occidentale, *Linn.*

THE CASHEW NUT TREE.

Vern.—*Kaju,* HIND; *Hijuli,* BENG.; *Kola mava,* TAM.; *Jīdi-mamidī,* TEL.; *Thee-hok-thayet,* BURM.

A small, evergreen tree in the coast forests of Chittagong, Tenasserim, Andaman Isles and South India.

VI.—LŒPA.

L. katinka, *Westwood.* 262

Sikkim, Shillong, North Khásia Hills, Sibsagar, Assam, Upper Burma.

SILK and SILK WORMS.

263 **L. miranda,** *Moore.*

Sikkim Himalaya.

264 **L. sikkima,** *Moore.*

Hot valleys of Sikkim.

265 **L. sivalica,** *Hutton.*

Mussoorie; forms a long-pointed cocoon of a dark greenish-grey colour.

VII.—NEORIS.

266 **N. huttoni,** *Moore.*

Mussoorie, North-West Himalaya; the worms appear in April; feed on the wild pear-tree; and spin a thin silken cocoon.

267 **N. shadulla,** *Moore.*

Yarkand.

268 **N. stoliczkana,** *Felder.*

Ladak.

VIII.—RINACA.

269 **R. zuleika,** *Hope.*

Sikkim.

IX.—RHODIA.

270 **R. newara,** *Moore.*

Nepal; spins a brilliant green cocoon; feeds on a species of weeping willow.

X.—SALASSA.

271 **S. lola,** *Westwood.*

Sikkim Himalaya.

XI.—SATURNIA.

272 **S. anna,** *Moore.*

Sikkim Himalaya.

273 **S. cidosa,** *Moore.*

Hot valleys of Sikkim Himalaya.

274 **S. grotei,** *Moore.*

Sikkim Himalaya.

275 **S. lindia,** *Moore.*

Found in the Sikkim Himalaya and Kulu.

Spathodea Rheedii, *Wall. See* **Dolchandrone Rheedii,** *Seem.*

SPONIA.

Sponia orientalis, *Planch.*, URTICACEÆ. 276

Vern.—*Badu, manu,* C. P.; *Tugla,* LEPCHA; *Jupong, phakram, jigini, sapong, &c.,* ASS.; *Mini,* TAM.

A small tree of the Himalaya from Nepal eastward to Bengal, Burma, Central and South India.

The bark yields a fibre, used to tie the rafters of native houses, for carrying loads, and for making the coarse cloth known in Assam as *Amphak*. Specimens of fibre, and of the rope and cloth made from this plant, should be obtained from Assam; but it would be interesting to see similar preparations if any such are made by the hill tribes of South India, where the plant also grows. It is often cultivated by the Coorg planters for shade, and is there known as the CHARCOAL TREE.

S. politoria, *Planch.* 277

Vern.—*Janúm, khasaroa, márni, bátú, banharia,* HIND.; *Bantaman, kanglu, khúri,* PB.; *Kháoi,* NEPAL; *Tuksat,* LEPCHA.

A small tree of the Salt Range, outer Himalaya, Oudh and Sikkim.

The bark yields a fibre which is used to tie the rafters of native houses and for carrying loads.

STERCULIA.

Sterculia colorata, *Roxb.*, STERCULIACEÆ. 278

Vern.—*Bodula, walena, samarri,* HIND.; *Moola,* BENG.; *Sitto-udal,* NEPAL; *Bhai-koi,* BOM.; *Khoausi,* MAHR.; *Karako,* TEL.; *Weshaw,* BURM.

A moderate-sized tree of the Sub-Himalayan tract from the Jumna eastward, Central and South India, Burma, and the Andaman Islands. (*Gamble.*)

The bark is used in rope-making. Fine specimens of the fibre were sent to the Paris Exhibition of 1878. (*Gamble.*) The liber furnishes an inferior fibre. (*Kurz.*)

S. guttata, *W. & A.* 279

Vern.—*Goladára,* MAHR.; *Kawili,* TAM.

A common tree of South India (Malabar).

Its bark yields a valuable cordage. The bark of the younger parts of the tree abounds with very strong, white, flaxen fibres, of which the inhabitants of the Wynaad manufacture a kind of coarse cloth. (*Spons' Enc., Gamble, &c.*)

S. urens, *Roxb.* 280

Vern.—*Gulu, kulu, tabsi, karrai,* HIND.; *Odla,* ASS.; *Kándúla, pándrúka* MAHR.; *Tabsu,* TEL.; *Vellay, putali,* TAM.

A large tree yielding a gum like Tragacanth met with in the sub-tropical forests of Bengal, Assam, Burma, and South India.

The liber yields a good fibre, specimens of which are reported as having been sent to the Paris Exhibition from Berar.

S. villosa, *Roxb.* 281

Vern.—*Udal, udar,* HIND.; *Poshwa,* SUTLEJ; *Gul-bodla, gul-kandar, massu,* PB.; *Omak, oadal, odela,* ASS.; *Vake-nar,* TAM.; *Sambeing,* MAGH.; *Bôjada,* AND.; *Shawní,* BURM.

A moderate-sized tree of the Sub-Himalayan tract from the Indus eastward; common in forests throughout India and Burma.

The tree is highly valued on account of the fibre obtained from the liber, which is coarse but strong, and is made into ropes and bags.

It is included by **Royle** among bast fibres. **Kurz** says it is valued by the Burmese *mahouts* (elephant-drivers) to such an extent that the tree has become scarce in the outer forests. It also yields a gum. The bark of **S. coccinea**, *Roxb.*, the *Sitto udal*, Nep., *Katior*, Lepcha, is used in the same way as that from **S. villosa**, and in fact indiscriminately.

Tassar or Tussah. *See* **Silk.**

THAMNOCALAMUS.

282 **Thamnocalamus spathiflorus,** *Munro*, GRAMINEÆ.

Vern.—*Ringall*, JAUNSAR; *Purmiok*, LEPCHA; *Myoosay*, BHUTIA.

The common small bamboo of Hattu and Deoban. It is generally found on the Himalayas from the Sutlej to Bhutan, above 8,000 feet.

It yields a fibre.

THESPESIA.

283 **Thespesia Lampas,** *Dalz.*, MALVACEÆ.

Vern.—*Bunkapas* is applied to this, as also to **H. Vitifolius**, *L.*, by the Bengalis; *Rán-bhendi*, MAHR.; *Rondapatti*, TEL.

A small bush common in the tropical jungles of India, ascending to 3,000 feet in Nepal.

The young twigs yield a good fibre.

284 **T. populnea,** *Corr.*

Vern.—*Parsipu*, HIND.; *Poresh, parash*, BENG.; *Bhendi*, MAHR.; *Poris, purasa, portia*, TAM.; *Gan-garaya*, TEL.; *Bendi*, GUZ.; *Sureya*, CINGH.

A moderate-sized, evergreen tree of the coast forests of India, Burma, and the Andaman Islands. Planted throughout India.

It yields a good fibre from the bark. (*Gamble.*)

TILIA.

285 **Tilia europæa,** *Linn.*, TILIACEÆ.

THE LIME TREE OF EUROPE; BAST FIBRE.

"The bark of this tree, when steeped in water, soon separates into thin layers, which are employed for making a coarse kind of rope, for making matted shoes much worn by the Russian peasantry, and also for making the mats which are so largely exported from Russia." (*Royle.*)

TRIUMFETTA.

286 **Triumfetta angulata,** *Linn.*, TILIACEÆ.

Vern.—*Aadai-otti*, TAM.; *Chikti*, HIND.

A herbaceous shrub, common in tropical and sub-tropical India and Ceylon.

Dr. Bidie includes the fibre of this plant in the list of fibres sent to the Paris Exhibition. Madras might be asked to supply specimens of both plant and fibre.

Mr. Cameron adds that this is one of the commonest weeds of Mysore. The fibre is soft and glossy.

TYPHA.

Typha angustifolia, *Linn.*, Typhaceæ. 287

A kind of bulrush, leaves of which are employed in making mats, and in stuffing chairs.

The Bally Paper Mills recently experimented on this grass as a paper fibre, and the report was apparently favourable. The stuff was described as easy of treatment.

T. elephantina, *Roxb.* 288

Elephant-grass.

Vern.—*Hogla,* Beng.; *Pan,* Pb.; *Rámbána,* Bom.

This species, like the preceding one, is also employed in making mats Elephants are fond of it; the roots bind the soil. (*Roxburgh.*)

ULMUS.

Ulmus Wallichiana, *Planch.*, Urticaceæ. 289

Vern.—*Mored, pabuna,* Hind.; *Kain, bren, amrai, marari,* Pb.

A large, deciduous tree of the North-Western Himalaya, from the Indus to Nepal, between 3,500 and 10,000 feet.

The bark contains a strong fibre, which is made into cordage.

An excellent fibre is made from the scape or flower-stalk. (*Cameron.*)

URENA.

Urena lobata, *Linn.*, Malvaceæ. 290

Vern.—*Bun-ochra,* Beng.; *Vana-bhenda,* Mahr.

A common shrub in India, found in waste places during the rains. Generally distributed over the hotter parts of India; one of the commonest associates of the mango and bamboo clumps of Bengal.

It abounds in strong fibre, which is considered suitable for the manufacture of sacking and twine.

U. sinuata, *Linn.* 291

Vern.—*Kunjia,* Beng.

A small bush, with deeply gashed leaves, found throughout the hotter parts of India.

It abounds in strong and tolerably fine fibre, which, like that from the preceding species, may be used as a substitute for flax.

URTICA.

Urtica crenulata, *Roxb.* *See* **Laportea crenulata,** *Gandeh.*

U. heterophylla, *Roxb.* *See* **Girardinia heterophylla,** *Dcne.*

VENTILAGO.

292 **Ventilago madraspatana,** *Gaertn.*, RHAMNEÆ.

Vern.—*Raktapita,* BENG.; *Lokandi, kanwail,* BOM.; *Papli,* TAM.; *Yerra chicatti,* TEL.; *Chorgu,* HYDERABAD.

An extensive climber met with in the forests of Central and South India.

The bark yields a useful fibre for cordage (*As. Res. 6, p. 352*). "Rumphius says that the Amboyna fishermen use the long stems instead of ropes." *(Voight.)*

VILLEBRUNEA.

293 **Villebrunea appendiculata,** *Wedd.*, URTICACEÆ.

Syn.—URTICA ACUIMNATA, *Roxb.*

Vern.—*Lipic, lipiah,* NEPAL; *Bunrhea,* ASS.

A small tree of the North-Eastern Himalaya, Khásia Hills, and Chittagong.

It yields a fibre of a brown colour, strong, and flexible, which is made into ropes, nets, and coarse cloth in Sikkim and Assam. This seems destined to prove one of our most valuable fibres in the future, and it deserves much attention. The tree grows freely and quickly and coppices readily.

294 **V. frutescens,** *Blume.*

Vern.—*Gartashiara, poidhanla, kagshi,* KUMAUN; *Kirma,* NEPAL; *Takbret,* LEPCHA.

A shrub, or small tree, with a rough, dark grey bark, found on the Himalaya, from Simla eastward, Sikkim, Bhutan and Assam, ascending to 5,000 feet.

The fibre is used for ropes. It is best adapted for fishing lines and nets, both from its strength and from its power of resisting moisture. (*Atkinson.*)

WIKSTRÖMIA.

295 **Wikströmia virgata,** *Meisn.*, THYMELACEÆ.

Vern.—*Bhatniggi, thilak,* PB.; *Chamlia,* KUMAUN.

A small shrub of the Himalaya, from the Indus eastward, the Khásia Hills, and Ceylon, between 5,000 and 7,000 feet.

An inferior sort of paper and rope is made from its bark in Kumaun. (*Atkinson.*)

WISSADULA.

296 **Wissadula rostrata,** *Blanch,* MALVACEÆ.

Syn.—SIDA PERIPLOCIFOLIA, *Willd., in Roxb. Fl. Ind. Ed., C. B. C., 516*; ABUTILON PERIPLOCEFOLIUM, *G. Don.*

Cultivated in India, naturalised in Ceylon, and very common in the south of the island. A native of the Malay Peninsula, Java, tropical Africa, and America.

"The bark of this abounds in serviceable flaxen fibres, and as it shoots quickly into long simple twigs, particularly if cut near the earth, it answers well for procuring the fibre of a good length for most purposes." (*Roxb. Fl. Ind.*) It is further reported to yield a beautiful hemp.

YUCCA.

297 **Yucca gloriosa,** *Linn.*, LILIACEÆ.

ADAM'S NEEDLE.

A native of America from Carolina to Mexico and Texas. Introduced into India, met with in gardens in Bengal, occasionally naturalised in the Madras Presidency.

The fibre which it yields resembles in many respects that of the **Agave,** and is applicable to similar purposes. There are several species, all of which yield excellent fibres; but **Y. gloriosa** is the principal one and may be taken as the type of the others. **Royle** alludes to **Y. angustifolia** and to **Y. filamentosa**, *L.*, the latter of which is sometimes known as the SILK-GRASS.

"The whole genus has been utterly neglected from an industrial point of view, no real attempt having ever been made to grow the plants on a commercial scale, though their hardiness, their preference for arid, barren sands, and the quality of their fibre would seem to be special recommendations." (*Spons' Enc.*)

In America the so-called **Californian Cactus,** which grows abundantly in the desert regions of Mojave and Ravena, is greedily sought after for paper manufacture. It would seem that this plant might with advantage be introduced into India. **Yucca gloriosa** yields an excellent fibre for paper.

Madras should be invited to supply specimens of **Yucca** plant, fibre, fabrics, and root.

The other day a correspondence was instituted in official circles regarding a plant which from its leaves gave a beautiful fibre, and from its roots an excellent soap. From the description, I conjectured that it might be **Yucca gloriosa**, and in support of the detergent properties of the roots, **La Maout** and **Decaisne's** *System of Botany,* edited by **Sir J. D. Hooker**, says: "The fruits of **Yucca** are purgative; its root is used as a soap." **Dr. Bidie** thinks that the root of **Yucca** does not possess detergent properties, having specially experimented with it in order to determine this point.

Additional information regarding this plant, and especially with regard to its roots, would be most acceptable.

ZEA.

298 **Zea Mays,** *Linn.*, GRAMINEÆ.

MAIZE OF INDIAN-CORN.

Vern.—*Bhutta, makka,* HIND.; *Janar,* BENG.; *Makha-jowari,* DEC.; *Makka cholam,* TAM.; *Makka-sonalu,* TEL.; *Pyaungboo,* BURM.

Largely cultivated in Upper India and the Himalaya.

It yields a fibrous material capable of being spun and woven like flax. The maize fibres may be prepared and spun into yarn, and some woven fabrics and all kinds of paper may be made of the same. (*Baden-Powell.*)

PART IV.

OILS AND OIL SEEDS, PERFUMERY, AND SOAPS.

ECONOMIC PRODUCTS OF INDIA,

EXHIBITED AT THE

Calcutta International Exhibition, 1883-84.

Part IV.—Oils & Oil Seeds, Perfumery & Soaps.

ACORUS.

Acorus Calamus, *Linn.*, Aroideæ. 1

Sweet Flag.

Vern.—*Vacha*, Sans.; *Vaj*, Arab.; *Bach*, Beng., Hind.; *Vekhanda*, Mahr.; *Vashambu*, Tam.; *Vadaja*, Tel.; *Linhe*, Burm.

A semi-aquatic perennial, native of Europe and North America, but cultivated in damp, marshy places in India and Burma for its medicinal virtues.

Balfour mentions this among his oils. An essential oil is obtained from the leaves, which is used in England by perfumers in the manufacture of hair powder. From the rhizome a pale to dark-yellow oil, with the strong penetrating odour of the root, and an aromatic, bitter, burning, camphoraceous flavour, is obtained by distillation.

ADENANTHERA.

Adenanthera pavonina, *Linn.*, Leguminosæ. 2

Vern.—*Rakta-chandan, ranjana*, Beng.; *Thorali-gunja*, Mahr.; *Ani kundamani*, Tam.; *Bandi gurivenda*, Tel.; *Manjati*, Mal.; *Gung*, Magh.; *Ywegyi*, Burm.

A deciduous tree of Bengal, South India, Burma and the Andaman Islands.

The seeds of this plant yield an oil.

ADIANTUM.

Adiantum Cappilus Veneris, *Linn.*, Filices. 3

Maiden Hair.

Vern.—*Dúm túli, bisfáig, parshawarsha*, Pb.

Common along ditches, &c., in the extreme north-west, and occasionally found in wells further east in the Punjab plains.

This is the fern which is used in making "Cappillare Syrup."

4 **Adul Oil** OF TRAVANCORE.

It was forwarded to the great Exhibition of 1851. The oil is medicinal. The botanical name of the plant is not known.

ALBIZZIA.

5 **Albizzia Lebbek,** *Benth.*, LEGUMINOSÆ.

THE SIRIS TREE.

Syn.—ACACIA SIRISSA, *Roxb.*

Vern.—*Siris, sirin, kalsis, tantia,* HIND.; *Sirisha,* BENG.; *Vaghe, kat vaghe,* TAM.; *Dirasan, pedda duchirram,* TEL.; *Kokko,* BURM.; *Be madá,* AND.

A large, deciduous tree of the Sub-Himalayan tract, from the Indus eastward, ascending to 5,000 feet; Bengal, Burma, Central and South India.

An oil extracted from the seeds is considered useful in leprosy.

ALEURITES.

6 **Aleurites moluccana,** *Willd.*, EUPHORBIACEÆ.

THE BELGAUM WALNUT; THE CANDLE NUT.

Syn.—A. TRIBOLA, *Forst.*

Vern.—*Akrot,* BENG.; *Akola,* HIND.; *Jáphala,* MAR.; *Nattu-akrotu-kottai,* TAM.; *Natuakrotu-vittu,* TEL.; *To-sikiyá-si,* BURM.

A handsome tree, introduced from the Malay Archipelago, now cultivated in many parts of South India.

The nuts of this plant contains 50 per cent. of oil, which is extracted and used for food and for burning. The oil is known as *Kekuna* in South India and Ceylon. The nuts when strung upon a thin strip of bamboo and lighted are said to burn like a candle. The oil is now exported to Europe for candle-making, and is reported to be equal to gingelly (sesame) or rape oils.

ALLIUM.

7 **Allium Cepa,** *Linn.*

ONION.

Vern.—*Palándu,* SANS.; *Piyáj,* BENG.; *Piyás,* HIND.; *Kánda,* MAHR; *Vella-Vengayam,* TAM.; *Nírelli,* TEL.; *Kyetthwunni,* BURM.

It is cultivated all over India.

"The bulbs contain an acrid, volatile oil, and act as stimulants, diuretics and expectorants." (*Baden-Powell.*) The oil is clear, limpid, pale, with a greenish tinge.

8 **A. sativum,** *Linn.*, LILIACEÆ.

GARLIC.

Vern.—*Mahaushadha, lasuna,* SANS.; *Sir,* PERS.; *Rasun,* BENG.; *Lasan,* HIND.; *Lasuna,* MAHR.; *Vallai-pandu,* TAM.; *Vellulli, tella-gadda,* TEL.; *Kyat-thou-bega, kyetthwunbya,* BURM.

It is cultivated all over India.

The seeds yield a medicinal oil, clear, colourless and limpid. Dr. Ainslie remarks that an expressed oil is prepared from the garlic, which is called *Vallay poondoo unnay*; it is of a stimulating nature, and the Vytians prescribe it internally to prevent the recurrence of the cold fits of intermittent fever; externally it is used in paralytic and rheumatic affections. (*Cooke.*)

ALNUS.

Alnus nepalensis, *D. Don.*, BETULACEÆ. 9

Vern.—*Kohi*, PB.; *Udesh*, KUMAUN; *Udis, utis*, NEPAL; *Kowal*, LEPCHA.

A large, deciduous tree on the Himalaya, from the Ravi eastward, between 3,000 and 9,000 feet; Khásia hills and Naga hills.

Said to yield an oil resembling birch oil. The plant is exceedingly common in the Khásia and Naga hills. Information and specimens should therefore be obtained from Assam.

Amarantus, sp. ? 10

Vern.—*Chulai.*

Mr. Baden-Powell mentions this among his medicinal oils.

Additional information with specimens of the oil and the plant from which it is obtained should be supplied by the Punjab.

Amaryllis, sp. ? 11

Mr. Baden-Powell mentions it as yielding a medicinal oil.

Additional information with specimens of the oil and the plant from which it is derived should be obtained from Punjab.

AMOMUM.

Amomum Subulatum, *Roxb.*, SCITAMINEÆ. 12

GREATER CARDAMOM.

Vern.—*Iláchi*, BENG., HIND.; *Veladode*, MAHR.; *Yelarsi*, TAM.; *Yelakulu*, TEL.; *Ben, pala*, BURM.

A native of the Eastern Archipelago.

The seeds yield a medicinal oil. It is an agreeable, aromatic stimulant. It is pale-yellow in colour, having the odour and flavour of the seeds.

AMOORA.

Amoora Rohituka, *W. & A.*, MELIACEÆ. 13

Vern.—*Rohituka*, SANS.; *Harin harra, harin khana*, HIND.; *Sohága*, OUDH; *Tikta-raj, pitraj*, BENG.; *Bandriphal*, NEPAL; *Thitni*, BURM.

An evergreen tree of Oudh, Northern and Eastern Bengal, Assam, Western Gháts and Burma.

In Bengal an oil is expressed from the seeds. The natives, where the tree grows plentifully, extract this oil, which they use for various economic purposes. (*Roxburgh.*)

ANACARDIUM.

Anacardium occidentale, *Linn.*, ANACARDIACEÆ. 14

THE CASHEW NUT; CARDOLE.

Vern.—*Kajú*, HIND.; *Hijuli*, BENG.; *Kájú*, MAR.; *Kola mava, mundiri*, TAM.; *Jidi mamidi*, TEL.; *Thihothayet*, BURM.

A small, evergreen tree, introduced from South America into the coast forests of Chittagong, Tenasserim, the Andaman Islands, and South India.

From this plant two distinct oils are obtained:

1st.—The kernels, when pressed, yield a light-yellow, bland oil, very nutritious; the finest quality in every respect equal to almond oil, and considered superior to olive oil. The kernels are so extensively eaten in India, however, that it is almost impossible that a trade could at present be done in this oil. The kernels have been once or twice exported to Europe under the name of "Cassia Nuts." Samples of this fixed oil, and information as to methods of preparation and extent of trade, are much required. The yield is about 40 per cent.

2nd.—"Cardole" or "Cashew-apple-oil." This is prepared from the pericarp or shell of the nut. It is black, acrid, and powerfully vesicating. It raises blisters, and is successfully used to remove warts, corns, and ulcers; also, in the Andamans, to colour and preserve fishing lines. It is also an effective preventive against white-ants in carved wood-work, books, &c. The yield is 29½ per cent.

ANAMIRTA.

15 **Anamirta Cocculus,** *W. & A.*, Menispermaceæ.

Cocculus indicus.

Vern.—*Kákmári,* Hind., Dec.; *Kákamári,* Sans.; *Pén-kottai,* Tam.; *Kaki-champa,* Tel.

A climbing shrub of South and East India, Burma, and Oudh forests.

The fruit contains a large quantity of fixed oil. The fat expressed from the seeds, which amounts to about half their weight, is used in India for industrial purposes.

AUCHUSA.

16 **Anchusa tinctoria,** *Linn.*, Boraginaceæ.

Mr. Baden-Powell mentions an oil as obtained from this plant.

ANDROPOGON.

17 **Andropogon.** *See* **A. Schœnanthes,** Gramineæ.

Sweet Calamus or Geranium Grass.

Syn.—A. Martinii, *Roxb.*; A. nardoidis, *Nees.*; A. Calamus aromaticus, *Royle.*; A. Pachnodes, *Trim.*

Vern.—*Rusá ghás,* Hind.

This grass grows wild in Central India, North-West Provinces, and Punjab.

The oil obtained from this plant is known as Rusa Grass Oil. This oil has many medicinal uses. It resembles, in quality and appearance, the Lemon Grass Oil. The oil is seldom taken internally by the natives, but is considered a powerful stimulant when applied externally. It is used as a liniment in chronic rheumatism and neuralgic pains.

The greatest confusion exists in the identification of the plants yielding the essential oils from this genus. Specimens of the plants (in flower) should, if possible, accompany the oils, so as to secure accurate identification.

18 **A. citratus,** *DC.*

The Lemon Grass.

Vern.—*Olá cháhá, gandhat rince,* Bom.

A large, coarse grass, found under cultivation in various islands of the Eastern Archipelago, and gone wild on extensive tracts of land in Ceylon; it rarely or never bears flowers. It is grown specially for its oil in Ceylon and Singapore.

The oil which it yields is chiefly employed in adulterating Verbena Oil. It is also used for perfuming soaps and greases. The annual production of otto of lemon grass in Ceylon is above 1,500 lbs., valued at 1*s.* 4*d.* per ounce. There is a large consumption of this otto in the manufacture of Eau de Cologne.

Andropogon muricatum, *Beauv.* 19

Vern.—*Usir,* SANS.; *Khas-khas ghás,* BENG.; *Khas,* HIND.; *Vette-ver,* TAM.; *Kumveru,* TEL.

This species of grass grows in abundance on high sandy banks and waste tracts in Bengal, the Coromandel Coast, and Upper India.

The roots, when distilled with water, yield a fragrant oil, which is used as a perfume, and as such it deserves the attention of European perfumers.

Andropogon Nardus, *Linn.* 20

THE CITRONELLA.

It grows wild abundantly in Singapore, but is also largely cultivated both in Ceylon and in Singapore.

The leaves are distilled with water, and yield over 3 oz. of essential oil from 1 cwt. The pure oil is thin and colourless, with a strong aromatic odour, and an acrid, citron-like flavour.

The average exportation of citronella from Colombo is about 40,000 lbs., valued at £8,000. It is largely used to give the peculiar flavour to what is known as "Honey-soap."

A. Schœnanthes, *Linn.* 21

THE GERANIUM GRASS.

Vern.—*Gandha-bena,* BENG.; *Rósegavata, rohisha,* BOM.

A grass indigenous to North and Central India.

An essential oil, known as "Ginger Grass," is obtained from this plant. The oil produced in the Namar district of the Nerbudda Valley is sometimes called "Grass Oil of Namar." This oil is largely exported from Bombay, its chief use in perfumery being apparently the adulteration of the otto of roses.

Ainslie calls **A. Nardus** (?) Ginger Grass or Spice Grass, and says that an infusion of it is used as a stomachic, and that occasionally an essential oil is prepared from it which is useful in rheumatism; but the plant he refers to is probably **A. Schœnanthes.** Specimens of plant and oil required.

Ainsomelis malabarica, *R. Br.*, LABIATÆ. 22

Ant-grease is prepared by boiling white ants and skimming off the oily substance which floats on the surface. An oily substance is also obtained by expression. Ant-grease is reported to be an article of food. 23

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Apricot. *See* **Prunus armeniaca.**

AQUILARIA.

Aquilaria Agallocha, *Roxb.*, THYMELÆACEÆ. 24

Vern.—*Ugúr,* HIND., BENG.; *Sasi,* ASS.; *Akyaw,* BURM.; *Aggali chandana,* TAM.; *Agru,* TEL.

A large, evergreen tree of Eastern Bengal, Burma, Malay Peninsula, and Archipelago.

An essential oil is obtained from the wood; used medicinally.

ARACHIS.

25 **Arachis hypogœa,** *Linn.*, LEGUMINOSÆ.

THE GROUND NUT.

Vern.—*Buchanaka,* SANS.; *Mát-kalái, chiner-bádám,* BENG.; *Mungphali,* HIND.; *Bhuishenga,* BOM.; *Viláyeti-múng,* DEC.; *Vérk-kadalai,* TAM.; *Verushanagakáya,* TEL.; *Myépe,* BURM.

An annual of South America, now generally cultivated in South India and some parts of Bengal and Upper India.

The seeds of this plant produce, on expression, a clear, straw-coloured oil which resembles olive oil in taste, and is used as a substitute for it in medicinal preparations. It is principally used for burning in lamps and in soap manufacture. It is said to be used also for adulterating gingelly oil in North Arcot.

ARGANIA.

26 **Argania Sideroxylon,** *R.S.*, SAPOTACEÆ.

Is the Argan tree of Morocco, which is found growing gregariously in forests in the Atlas Mountains.

An oil resembling olive oil is extracted from the seeds. It has a clear, light-brown colour, and a rancid odour and flavour. It is an important domestic oil among the Moors, and to a certain extent finds its way to India

ARGEMONE.

27 **Argemone mexicana,** *Linn.*, PAPAVERACEÆ.

Vern.—*Brahma dandi,* SANS.; *Shial-kanta,* BENG.; *Bharbhánd,* HIND.; *Dáruri,* MAHR; *Birama-dandu,* TAM.

"A herbaceous annual, native of Jamaica, the Caribbee Islands and Mexico, brought to India about three centuries ago, now grows spontaneously on waste lands at the beginning of the cold season." (*Amsterd. Cat.*)

The seeds yield a pale yellow, clear, limpid oil, used in lamps and medicinally in ulcers and eruptions. In Bengal, and more or less throughout India, the seeds are collected and pressed for their oil, which is yielded as copiously as that from mustard-seed. The drawn oil is twice allowed to stand for a few days to deposit a whitish matter, after which it remains clear and bright. (*Spon's Ency.*)

ARGYREIA.

28 **Argyreia speciosa,** *Sweet.*, CONVOLVULACEÆ.

ELEPHANT-CREEPER.

Vern.—*Samudra palaka,* SANS.; *Bich-tarak, guguli,* BENG., HIND.; *Samudra shoka,* MAHR.; *Shamuddirap-pach-ch-ai,* TAM.; *Pála-samudra,* TEL.

A twining perennial, found all over India.

Reported to yield oil. No further information available.

ARTEMISIA.

29 **Artemisia vulgaris,** *Linn.*, COMPOSITÆ.

WORMWOOD.

Vern.—*Afsantine-hindí,* ARAB.; *Granthiparni,* SANS.; *Mastaru,* BENG.; *Májtari,* HIND.; *Máchi-pattiri,* TAM.; *Machi-patri,* TEL.

Baden-Powell mentions this plant in his list of oils. It also yields a volatile oil.

Information and specimens required.

ATALANTIA.

Atalantia monophylla, *Corr.*, RUTACEÆ. 30

WILD LIME.

Vern.—*Arawi nim,* TEL.; *Katyalu,* TAM.; *Makhur, mákar-limbu,* MAHR.

A plant of Eastern Bengal, South India and Ceylon.

Ainslie says that the berries of this thorny plant yield a warm oil, which is, in native medicine, considered as a valuable application in chronic rheumatism.

Madras might be asked to supply specimens of this, also the berries from which it is prepared, together with any further information.

BALANITES.

Balanites Roxburghii, *Planch.*, SIMARUBEÆ. 31

Syn.—B. ÆGYPTIACA.

Vern—*Hingu, ingua, hingol, hingota,* HIND.; *Garrah,* GONDI; *Gari, ringri,* TEL.; *Nanjunda,* TAM.; *Hingan,* MAR.

A small tree growing in the drier parts of India and Burma.

A fixed oil is expressed from the seed.

BALIOSPERMUM.

Baliospermum montanum, *Müll. Arg.*, EUPHORBIACEÆ. 32

Vern.—*Hakún,* HIND.; *Dánti,* MAR.; *Konda-amadum,* TEL.; *Poguntig,* LEPCHA.

Found in South India, Burma, Bengal, Nepal and Sikkim.

The oil expressed from the seeds possesses cathartic properties.

BALSAMODENDRON.

Balsamodendron Roxburghii, *Arn.*, BURSERACEÆ. 33

Vern.—*Gugala,* BENG.

A small tree of Eastern Bengal and Assam.

Baden-Powell mentions that the plant yields a medicinal oil.

Barringtonia Racemosa, *Gaertn.*, MYRTACEÆ. 34

BASSIA.

Bassia butyracea, *Roxb.*, SAPOTACEÆ. 35

THE INDIAN BUTTER TREE.

Vern.—*Chiára, Chaiára, phulel,* KUMAUN; *Cheuli,* OUDH; *Phalwara,* HIND.; *Chúri,* NEPAL; *Yel, yel pote,* LEPCHA.

A deciduous tree of the Sub-Himalayan tract, from Kumaun to Bhutan, between 1,500 and 4,500 feet.

A vegetable butter is extracted from the seeds, of the consistency of fine lard and of a white colour. The oil being cheaper than ghee or fluid butter it is used as an adulterant. It is also burnt in lamps. In medicine it is highly valued for its efficacy in rheumatism and contraction of the limbs. It is also used by the wealthier classes as an ointment, after it is perfumed with cloves or attar of roses. The butter mixed with scented oil is reckoned a valuable preservative when applied to hair. It makes excellent soap, and may be utilised in the manufacture of candles, as it burns with a bright light, without smoke or smell. The butter readily dissolves in alcohol.

36 **Bassia latifolia,** *Roxb.*

MAHUA TREE.

Vern.—*Mahwa, mowa, mahúa,* HIND.; *Mahwa, mahúla, maul,* BENG.; *Mora,* MAHR; *Illupi, kat illipi,* TAM.; *Ippi, yeppa,* TEL.; *Irúp,* GONDI; *Honge,* KAN.

A large, deciduous tree, indigenous in the forests of Central India. It is cultivated and self-sown all over India, very common in Chutia Nagpur.

A greenish-yellow oil is extracted from the kernel of the fruit, which is eaten by the Gonds and other Central Indian tribes, and is used to adulterate ghee. It is a useful oil for soap, and is largely used by the poorer classes as a lamp oil. It is called *Madhuka Sára* in Sanskrit, and is recommended as a medicine for cephalalgia. It is often sold baked in cakes, which keep fresh for a few months in cold climates, but in the plains of India soon become rancid, separating into a clear oil and a brown fatty substance. The cakes are sold as *Illipi Butter.*

37 **B. longifolia,** *Willd.*

Vern.—*Kat illupi, elupa,* TAM.; *Ippi, yeppa, pinna,* TEL.; *Mee,* CINGH; *Kan zan,* BURM.

A large, evergreen tree of South India and Ceylon.

An eil is expressed from the ripe fruit. It is yellow and semi-solid; used for burning, for soap, and to adulterate ghee. It is seldom sold in the bazar. The natives extract an oil from the seeds for private consumption. It is suitable for the manufacture of candles. In medicine it is used externally in cutaneous diseases.

The crushed seeds from the preceding species of **Bassia,** after separation of the oil, are baked into cakes and sold as a detergent, largely used for washing the hair.

BAUHINIA.

38 **Bauhinia acuminata,** *Linn.,* LEGUMINOSÆ.

Vern.—*Kanchan,* BENG.; *Kachnar,* HIND.; *Mahahlega byu,* BURM.

A handsome shrub of South India and Burma.

It is mentioned as an oil-yielding plant in *Spons' Encyclopædia.*

39 **B. tomentosa,** *Linn.*

Vern.—*Kachnar,* HIND.; *Kanchini,* TAM., TEL.

It is a shrub or small tree of South India, with showy, yellow flowers, having a purple eye, and a tough wood, with nearly black heartwood.

Balfour simply mentions this plant among his oils, without describing it.

40 **B. variegata,** *Linn.*

Vern.—*Kachnar, koliár, bariál,* HIND.; *Taki,* NEPAL; *Rakta kanchan,* BENG.; *Borara,* URIYA; *Segapu-munthari,* TAM.; *Kanchivala-do,* KAN.; *Bwéchin,* BURM.

A moderate sized, deciduous tree of the Sub-Himalayan tract from the Indus eastward, and throughout the forests of India and Burma. It is often planted for ornament.

The seeds are said to yield an oil, of which further information is required.

BENINCASA.

Benincasa cerifera, *Savi.*, CUCURBITACEÆ. 41

THE PUMPKIN or WHITE MELON.

Syn.—CUCURBITA PEPO, *Lour.*

Vern.—*Pethá, chal-kumra, gol kaddú,* PB.; *Kumrá,* BENG.; *Golkaddue, kondha,* HIND.: *Kumhrá, bhunja,* KUMAUN; *Kohola,* MAHR.; *Kumbuli,* TAM.; *Budide gummadi,* TEL.; *Kyauk-pa-yon,* BURM.

It is cultivated in India.

The fruit of this plant secretes upon its surface a waxy substance which resembles the bloom found on plums and cucumbers. It is said to be produced in sufficient quantity to be collected and made into candles.

The seeds also yield a mild, bland, pale-coloured oil. As this plant seems to have been very much confused by botanists with **Cucurbita Pepo,** *Dale,* it is probable that the native names given for the one may belong to the other. It would be very important to have specimens of the plants from which these oils have been prepared supplied along with the oils so as to admit of final determination. The greatest possible confusion seems to exist in the literature of the economic portions of this subject.

Benzoin. *See* **Styrax Benzoin.** [290]

BERBERIS.

Berberis aristata, *DC.*, BERBERIDEÆ. 42

Vern.—*Súmlú, simlu, chitra,* PB.; *Chitra,* NEPAL; *Chotra,* HIND.

An erect, spiny shrub, on the outer Himalaya, from the Sutlej to Bhutan: in the North-West Himalaya, from 6,000 feet to 10,000 feet; in Darjeeling above 10,000 feet; Western Ghâts at high elevations; Ceylon. (*Gamble.*)

The seeds of this plant yield an oil.

B. Lycium, *Royle.* 43

Vern.—*Kasmal,* SIMLA; *Kashmal, chotra,* HIND.

An erect, rigid shrub of the North-West Himalaya, from 3,000 to 9,000 feet.

The seeds of this plant yield an oil.

BETULA.

Betula alba, *L.*, CUPULIFERÆ. 44

An essential oil is extracted from the common birch.

Information as to whether this is ever prepared in India would be acceptable.

Birch oil. *See* **Betula alba,** *L.* [44]

BOMBAX.

45 **Bombax malabaricum,** *DC.*, MALVACEÆ.

THE COTTON TREE.

Syn.—B. HEPTAPHYLLUM, *Cav.*

Vern.—*Semul, shembal, semur, pagun, somr,* HIND., BENG.; *Bouro,* URIYA; *Bolchú,* GARO; *Sávara,* MAR, *Búrga, búrgú, buraga,* TEL.; *Illavam, pulá,* TAM.; *Katu-imbúl,* CINGH.; *Letpan,* BURM.

A very large, deciduous tree, throughout India and Burma.

Cooke, in his *Oils and Oil-seeds,* makes mention of this plant as yielding an oil, but gives no other information about it.

BRASSICA.

46 **Brassica alba,** *H. f. & T.*; *T.*, CRUCIFERÆ.

THE WHITE MUSTARD.

Vern.—*Sidhartha,* SANS.

The seeds are very large and white.

The oil is little known, but the oil-cake is much prized as a food for sheep in Europe; black oil-cake is not considered so good for this purpose.

47 **B. campestris,** *Linn.*

Var. I. campestris, *proper.*

THE COLZA, SWEDISH TURNIP and SARSON.

Syn.—SINAPIS DICHOTONA, *Roxb.*

Vern.—*Sarson* or *serson, sursi, jariya,* HIND.; *Sarshapa,* SANS.; *Sursha* or *sursi, sauchi, kali sarson, sadarai,* BENG.; *Sherasa,* MAR.;

The seeds are small, smooth, light brown.

Colza Oil is used by the natives of India chiefly to anoint the body and for illuminating purposes. I am inclined to think a serious mistake has been committed by European authors in regarding this as identical with **S. glauca,** *Roxb.* The latter plant yields a decidedly superior oil, and both seed and plant are readily distinguished by the most ordinary native, and their properties narrated with a precision which indicates centuries of experience.

48 **Var. 2. Napus.**

THE RAPE, RARA-SARSON, or SHWET-RAI.

Syn.—SINAPIS GLAUCA, *Roxb.*; S. GLAUCA, *Royle.*

Vern.—*Rara sarson, rara lai, pila sarson, tore, toriya, dain, sheta, shirsha,* HIND.; *Tuverica,* SANS.; *Raira,* GUZ.; *Shwet-rai,* BENG.

The seeds are larger than those of the preceding form, smooth and white.

The oil is superior to the preceding, and is much used in diet.

49 **Var. 3. Rapa.**

THE TURNIP.

Vern.—*Shalgam,* HIND., BENG.

An oil has been prepared, but is of no value.

50 **B. juncea,** *H. f. & T. T.*

THE RAI OR INDIAN MUSTARD.

Vern.—*Rai, sarson, rajika,* HIND, BOM.

The seeds of this form are smaller than those of either of the preceding forms; round, almost black, and pitted or rugose.

The oil is clear, not rancid, and largely eaten by the natives with their curries, &c. **Roxburgh** apparently regarded this oil as inferior to rape oil. It is, however, much purer than the oil from either of the preceding forms and devoid of the peculiar smell so characteristic of the oils from the forms of **B. campestris.** This seems to be the oil called Mustard Oil in India, so largely prepared in our jails by convict labour. The seeds are reported generally to yield about 20 per cent. of oil.

Brassica nigra, *Koch.* 51

THE BLACK OF TRUE MUSTARD.

Vern.—*Rai, kali rai, asl-rai, ghor-rai, makara-rai,* &c., HIND.; *Rai sarisha,* BENG.; *Kadagho,* TAM.; *Avalo,* TEL.; *Ganaba,* CINGH.; *Kiditsai,* CHINESE; *Rajika, sanshap,* SANS.; *Sirshaf* (the name by which it is known in Indian hospitals), PERS.; *Khirdal,* ARAB.

Cultivated in various parts of India and Tibet, chiefly on the hills.

The seeds are large, oblong, smooth and almost black.

A bland oil, expressed from the seeds, is used for various economic purposes. About 23 per cent. is usually extracted from the seeds. The oil is inodorous, non-drying, and it solidifies at 0°F. It consists essentially of glycerides, of stearic, oleic, erucic, and brassic acids, the last being homologous with oleic acid.

The ancient Hindus do not appear to have known anything of the essential oil of mustard. This oil does not exist in the seeds originally, but is chemically produced by the action of water, as, for example, when a seed or a little of the flour is put in the mouth. Chemically, Mustard seeds consist of a bland, fixed oil (obtained by pressure), and a peculiar inodorous substance called *Myronic Acid,* together with a third substance, which has been called *Myrosyne.* By the action of water upon these substances the essential oil is produced, which is known chemically as *Pyrosyne.*

BUCHANANIA.

Buchanania latifolia, *Roxb.*, ANACARDIACEÆ. 52

Vern. –*Chirauli,* PB.; *Achár, char, chironji,* C.P.; *Kat-maá, aima,* TAM.; *Chara, morli,* TEL.; *Charwari,* HYDERABAD; *Pyál, charoli,* BOM.; *Lunbo,* BURM.

A tree of the Sub-Himalayan tract, from the Sutlej eastward, ascending to 3,000 feet. Throughout India and Burma.

The kernels of the fruit yield an oil called *Chironji.* Owing to the kernels being so much prized as a sweet-meat when cooked, the oil is rarely met with. It is pale, straw-coloured, limpid, sweet and wholesome.

BUTEA.

Butea frondosa, *Roxb.*, LEGUMINOSÆ. 53

Vern.—*Palash,* BENG.; *Dhak,* HIND.; *Parasa,* TAM.

A small distorted tree, becoming covered with deep orange flowers before the appearance of the leaves; met with all over India.

The seeds of this tree yield a small quantity of bright, clear oil, which is sometimes used medicinally.

Butter. 54

"The fatty portion of the milk of all mammalian animals is called 'Butter,' but the term in a commercial sense is restricted to that from the cow." (*Spons' Encyclop.*)

CÆSALPINIA.

55 **Cæsalpinia Bonducella,** *Roxb.*, LEGUMINOSÆ.

THE FEVER NUT.

Vern.—*Katkaranj*, HIND.; *Nata*, BENG.; *Sagurgota*, *gajaga*, MAR.; *Gajkai*, KAN.; *Gech-chakkay*, TAM.; *Kalein*, BURM.

Found all over India, especially in Bengal, Burma and South India.

The seeds contain an oil, which is mentioned by **Ainslie** as useful in convulsions and palsy. The seeds also possess valuable tonic properties, for which they are much prized by the natives.

56 **C. digyna,** *Rol.*

Syn.—C. OLEOSPERMA, *Roxb.*

Vern.—*Umul-koochi*, BENG.; *Noonee gatcha*, TEL.; *Vákerichebhate*, BOM.

A tree of the Eastern Himalayas, Eastern and Western Peninsulas, and Ceylon.

Roxbugh says that an oil is expressed from the seeds, which is used for lamps.

[198] **Cajput Oil.** *See* **Melaleuca Leucadendion.**

CALENDULA.

57 **Calendula officinalis,** *Linn.*, COMPOSITÆ.

Vern.—*Zergul*, *sadbarg*, *PC.*

Found in the fields of the Punjab and Sind, scarcely indigenous; Peshawur. (*Aitchison*).

Baden-Powell, in his *Punjab Products*, mentions it as an oil-yielding plant. The oil is used for medicinal purposes.

CALOPHYLLUM.

58 **Calophyllum inophyllum,** *Linn.*, GUTTIFERÆ.

THE ALEXANDRIAN LAUREL.

Vern.—*Sultana champa*, HIND., BENG.; *Surangi*, *undi*, MAR; *Pinnay*, TAM.; *Pongnyet*, BURM.; *Púna*, *púnás*, TEL.

An evergreen tree of South India, Burma, and the Andaman Islands; often cultivated for ornament in other parts of India.

The fresh seeds when shelled yield a large quantity of fragrant, green oil, amounting even to 60 per cent. by weight. The oil varies in colour from greenish yellow to deep-green, possesses a disagreeable flavour, and an odour which is described as fragrant by some but unpleasant by others. It is used for lamps and for caulking vessels; but it is chiefly valued as a medicine and used as an external application in rheumatic affections. It is a curious fact in connection with this oil, that though it cannot compete with castor-oil for industrial purposes in the Calcutta market, it fetches about four times the Calcutta price of castor-oil in Burma. This is owing to its present crude condition, and no method of refining having been attempted. **Mr. Gamble** says that in Orissa the tree is much cultivated and an oil extracted from the seeds is used for burning.

59 **C. tomentosum,** *Wight.*

THE POON SPAR TREE.

Vern.—*Poon*, *poone*, MAL.; *Pongoo*, TAM.; *Siri poone*, KAN.

A large, tall, evergreen tree, found in the evergreen forests of the Western coast from Kanara southward.

The seeds yield an abundance of oil, in Ceylon, where it is known as "Keena-tel." It is probably used as a lamp-oil.

Calophyllum Walkeri, *Wight.* 60

A large tree, found in South India and Ceylon.
The seeds yield an oil, used for burning.

C. Wightianum, *Wall.* 61

Syn.—C. SPURIUM, *Chois.*
Vern.—*Katpoon, kull-ponne,* KAN.; *Cheru pinnay,* TAM.

An evergreen tree of the Western Ghâts, from the Konkan to Travancore.

The seeds yield an oil not greatly differing from that of **C. inophyllum.** It is used as a lamp-oil and as a medicine in leprosy and cutaneous affections, and in infusion mixed with honey in scabies and rheumatism.

CAMELLIA.

Camellia theifera, *Griff.*, TERNSTRŒMIACEÆ. 62

Syn.—THEA CHINENSIS, *Linn.*; T. ASSAMICA.
Vern.—*Cha.*

Cultivated in many districts in India, especially in Kangra, Kúlú, Dehra Dún, Kumaun, Darjeeling, the Western Dúars, Assam, Cachar, Chittagong and Hazaribagh, as well as in the Nilgíri Hills and Ceylon.

"The seeds of the tea-plant contain a considerable proportion of oil, as much as 1 cwt. being obtainable by industrial means from 3 cwts. of seed. It is limpid, clear, tasteless and of an amber colour. The oil resembles that of olive, burns with a clear, bright light, and is free from unpleasant odour." (*Spons' Enc.*) It is not fit for use as an edible oil, nor can it be used for burning; but experiment has shown that it can be utilised in the manufacture of a superior kind of soap. A soft soap, without smell, of a light brown colour, may be produced from this oil with potash, which is most suitable for cleansing purposes.

Camphor. 63

Vern.—*Karpura,* SANS.; *Kafnr,* PERS.; *Karpur,* BENG.; *Kafur,* HIND.; *Karuppuram,* TAM.; *Karpuram,* TEL.; *Pa-yók* BURM.

The name "Camphor" is technically given to a number of gum-resins, more or less resembling each other, derived from (1) **Cinamomum Camphora,** *Nees. and Eberm.*, called the Japan Camphor Tree; (2) **Dryobalanops Camphora,** *Colebr.*, a tree of Sumatra; (3) **Blumea balsamifea,** *DC.*

The natives of Sumatra collect an oil by making a transverse deep incision, into the tree, so as to form a cavity of the capacity of about a quart. In this they place a lighted weed for a few minutes, and then leave the hole for the night when it becomes filled with the oil. In Japan, the oil is expressed from the Camphor, and is employed for burning purposes by the poorer people. Camphor oil is said to be useful in rheumatism and in giving firmness to the teeth.

CANANGA.

Cananga odorata, *H. f. & T.*, ANONACEÆ. 64

THE ILANG-ILANG of European Perfumers.

Syn.—UVARIA ODORATA, *Linn.*

Vern.—*Kadatngan,* BURM.; *Ilang-ilang,* MAL.

A large, evergreen tree of Burma (Ava and Tenasserim), distributed to Java and the Philippines. Cultivated in many parts of India on account of its sweet-smelling flowers.

An otto is prepared from these flowers known as Otto of Ilang. It is highly esteemed, as may be seen from the fact that it fetches about 18*s.* to 22*s.* per oz. in Europe. It is frequently blended with pimento, orris, rose, tuberose and jasmine in the preparation of handkerchief scents.

Further information and samples of this otto might be obtained from Burma. *See* **Michelia.**

CANARIUM.

65 **Canarium commune** *Linn.*, BURSERACEÆ.

JAVA ALMOND.

Vern.—*Jungli badam*, HIND.

Found in the Peninsula and Malabar.

It yields a semi-solid oil, similar in appearance to cocoa-nut oil. It is used for culinary purposes, and is regarded as more palatable than cocoa-nut oil.

CANNABIS.

66 **Cannabis sativa,** *Linn.*, URTICACEÆ.

HEMP.

Vern.—*Ganja, bhang, &c.*

An annual, 4 to 6 feet; found wild or cultivated.

The seeds, when expressed, yield a pale, limpid oil. The seeds contain about 34 per cent. of this oil. It is at first greenish or brownish-yellow; but the colour deepens when it is exposed to the air. The flavour is disagreeable, but the odour is mild. In Russia it serves, in a great measure, the purpose of lamp-oil, but it is chiefly employed in the manufacture of soft soaps.

CARAPA.

67 **Carapa moluccensis,** *Lam.*, MELIACEÆ.

Vern.—*Poshur, dhundul*, BENG.; *Kandalanga*, TAM.; *Pinlé-ón*, BURM.

A moderate sized, evergreen tree, of the coasts of Bengal, Malabar, Burma and Ceylon.

The seeds yield, on expression, a whitish semi-solid fat. It remains fluid only at high temperatures. It is used as a hair-oil, and also for burning purposes.

[12] **Cardamom seed oil.** *See* **Amomum Subulatum.**

CARTHAMUS.

68 **Carthamus oxyacantha,** *Bieb.*, COMPOSITÆ.

Vern.—*Kantiari, kandiara, poli, kharesa*, PB.

Found in the North-West Provinces and Punjab.

Dr. Stewart says that near Peshawar and elsewhere an oil extracted from the seeds is used for illuminating purposes, as well as for food. It is also said to be used medicinally.

69 **C. tinctorius,** *Linn.*

THE SAFFLOWER.

Vern.—*Kamalottara*, SANS.; *Kusum*, BENG., HIND., DEC.; *Sendurgam, kashumba*, TAM.; *Agnisikha*, TEL.; *Su*, BURM.

An annual, grown extensively all over India.

"There are two seeds—one, the cultivated, is white and glossy, the other (Karar) is a smaller but similarly-shaped seed, mottled or dusted, brown-grey and white; both yield oil. The oil is very clear, yellow, is esculent, and would be peculiarly suitable for burning in lamps, on account of the little heat which it gives out." (*Baden-Powell.*) It is also used locally for culinary purposes, and is said to form an ingredient of the "Macassar Hair-oil." The yield of this oil is about 25 per cent. In paralytic affections and bad ulcers, it is used as an external application.

CARUM.

Carum Carui, *Linn.*, UMBELLIFERÆ. 70

CARAWAY SEED.

Vern.—*Jira,* BENG.; *Zira,* HIND.; *Shimai-shombu,* TAM.; *Shimai-sapu* TEL.

The plant is cultivated for its seeds as a cold season crop on the plains; also frequent on the hills.

A valuable essential oil is obtained from the seeds, called Caraway Oil. This oil is colourless or pale-yellow, thin, with strong odour and flavour of the fruit. It is used in medicine and more extensively as a perfume for soaps.

Carum copticum, *Benth.* 71

TRUE BISHOP'S WEED; LOVAGE.

Syn.—PTYCHOTIS AJOWAN, *DC.*

Vern.—*Jowan,* BENG.; *Ajowan,* HIND.; *Oman,* TAM.; *Omamu,* TEL.

Cultivated in many parts of India for its seeds.

The seeds yield an oil on distillation with water, which is used medicinally in cholera, colic, and indigestion.

CARYOPHYLLUS.

Caryophyllus aromaticus, *Linn.*, MYRTACEÆ. 72

CLOVES.

Vern.—*Lavanga,* BENG.; *Long,* HIND; *Kiramber,* TAM.; *Lavangalu,* TEL.

It is indigenous in the Moluccas.

The flower-buds and flower-stalks of cloves yield, when distilled with water, an essential oil. The process of distillation is largely carried on in England. It is a colourless or a yellowish oil having a powerful odour and flavour of cloves. It easily combines with grease, soap, and spirit, and is extensively made use of in the manufacture of perfumery. In Germany it is often adulterated with carbolic acid.

CEDRUS.

Cedrus Deodara, *Loudon,* CONIFERÆ. 73

DEODAR; HIMALAYAN CEDAR.

Vern.—*Nakhtar,* AFG.; *Diár, deodár, dadár,* HAZARA, KASHMIR, GARHWAL, KUMAUN; *Palúdar,* HAZARA; *Giam,* TIBET.

A very large and tall tree of the North-Western Himalaya, between 4,000 and 10,000 feet; extending east to the Danli river, a tributary of the Aloknanda, below the Niti Pass, mountains of Afghanistan and North Biluchistan.

"An oil is obtained from the wood by destructive distillation; it is dark-coloured, thick, and resembles crude turpentine. It is used for anointing the inflated skins which are used for crossing rivers, and as a remedy for ulcers and eruptions, for mange in horses and sore feet in cattle." (*Gamble.*)

CELASTRUS.

74 **Celastrus paniculatus,** *Willd.*, CELASTRINEÆ.

Vern.—*Malkakni*, OUDH, KUMAUN; *Kohundan rangul*, C. P.; *Kanguni* BOM.; *Ruglim*, LEPCHA. The seeds are generally called *Malkangni.*

A scandent shrub of the outer Himalaya, from the Jhelam to Assam, ascending to 4,000 feet; East Bengal, Behar, South India and Burma.

The seeds yield by expression a deep scarlet oil, used medicinally. It is much admired as an external application along with a poultice of the crushed seeds. It is also burnt in lamps, and employed in certain religious ceremonies.

By a process of distillation the natives also obtain from the seeds a black empyreumatic oil, which has been experimented with by European practitioners under the name of "**Oleum nigrum.**" Dr. **Herklots** affirms that it is a sovereign remedy in Beri-beri in doses of from 10 to 15 drops twice daily. It is a powerful stimulant, followed in a few hours with free diaphoresis, unattended with subsequent exhaustion (*Pharmacopœia India.*) Dr. **Dymock** describes this empyreumatic oil as prepared by distilling the seeds along with benzoin, cloves, nutmegs, and mace.

75 **C. senegalensis,** *Lam.*

Syn.—C. MONTANA, *Roxb.* GYMNOSPORIA MONTANA, *Lawson.*

Vern.—*Sherawane*, TRANS-INDUS; *Talkar, dajkar, kharái*, PB.; *Baikal gajachinni*, C. P.; *Mál kangoni*, BOM.; *Danti, pedda chintu*, TEL.

A tall, spinescent shrub of the northern dry and intermediate zones, North-West India, ascending to 4,000 feet, Central India, and the drier parts of the Peninsula.

By pressing the seeds a deep scarlet-coloured oil is obtained as thick as treacle. It is used for medicinal purposes.

CERBERA.

76 **Cerbera Odollam,** *Gaertn.*, APOCYNACEÆ.

Vern.—*Dabúr, dhakur*, BENG.; *Kadamá, katarali*, TAM.; *Kalwa*, BURM.

A moderate sized evergreen tree of the coast forests of India and Burma.

The seeds yield an oil which is used for burning. (*Kurz.*)

The Burmese also use it to anoint the head.

[303] **C. Thevetia,** *Linn.* *See* **Thevetia neriifolia,** *Linn.*

[52] **Cheeronjee oil.** *See* **Buchanania latifolia.**

CINNAMOMUM.

77 **Cinnamomum zeylanicum,** *Breyn.*, LAURACEÆ.

TRUE CINNAMON.

Vern.—*Dalchini*, HIND.; *Karruwa*, TAM.; *Sanalinga*, TEL.; *Rassu kurundu*, CINGH.; *Lulingyaw, thitkyabo*, BURM.

It is a native of the Ceylon forests, but now cultivated on the western coast of that island.

The liber of this plant yields the essential oil of Cinnamon, an oil of considerable importance. Three oils are obtained from this plant, one from the bark to the extent of ½ to 1 per cent. Distillation is carried on extensively in Ceylon, and occasionally in England. It is of a golden-yellow colour, with the powerful odour of Cinnamon, sweet and aromatic, but with a burning flavour. It is largely used in perfumery. The leaves yield a brown, viscid, essential oil, of clove-like odour, sometimes exported from Ceylon. The third oil is obtained from the root, of yellow colour, specifically lighter than water, with an odour of camphor and cinnamon.

CITRULLUS.

Citrullus Colocynthis, *Schrad.*, CUCURBITACEÆ. 78

Vern.—*Indrayan*, HIND.; *Makhal*, BENG.; *Indrayan, indraphal*, MAR.; *Paycoomuti*, TAM.; *Putsa kaya*, TEL.; *Indrawan*, DEC.; *Sheti-putsa*, CINGH.

An annual, found in the Peninsula and South India.

Yields a clear, limpid oil, according to **Ainslie**, used in many of the southern provinces for burning in lamps.

C. vulgaris, *Schrad.* 79

THE WATER-MELON.

Vern.—*Karbus*, N. W. P.; *Samanka*, HIND.; *Kalingada*, MAR.; *Payé*, BURM.

Cultivated very generally, especially in Upper and North India.

The seeds yield a clear, bland, pale-coloured, limpid oil, used for burning in lamps.

CITRUS.

Citrus medica, *Linn.*, RUTACEÆ. 80

Var. I. medica proper.

THE CITRON. CEDRATIER, **Fr.**; **cedro, It.**

Vern.—*Vijapúra*, SANS.; *Utrej, otroj*, ARAB.; *Bijaura*, HIND.; *Begpura*, BENG.

Cultivated in many parts of India—Assam, Calcutta, Chutia Nagpur, North-West Bombay; also in Persia.

Var. 2. Limonum. 81

THE LEMON. LIMONIER, more generally CITRONNIER, **Fr.**; LIMONE, **It.**; CITRONE, **Germ.**

Vern.—*Bara nimbu*, HIND.; *Korna Nebu*, BENG.

Cultivated abundantly in the south of Europe.

Citric acid is made from it.

Var. 3. acida. 82

THE SOUR LIME OF INDIA.

Vern.—*Jambira*, SANS.; *Limu, limoun*, ARAB.; *Libu, nebu, limbu, nimbu*, BENG., HIND.

Var. 4. Limetta. 83

THE SWEET LIME OF INDIA.

Vern.—*Mitha Nebu*, BENG., HIND.; *Amrit-phal*, KUMAUN.; *Thanbaya*, BURM.

Commonly cultivated in most parts of India and Burma.

The rind of the Lemon, when subjected to expression, or when distilled, yields an essential oil known as "Essence of Lemon," or "Citron-zeste" according to the method employed. For this purpose the fruits are plucked very early, because they contain more oil when they are still green and unripe. Lemon-oil is extensively used in the manufacture of perfumery.

CLEOME.

84 **Cleome viscosa,** *Linn.*, CAPPARIDEÆ.

WILD MUSTARD.

Vern.—*Hur-huria,* BENG.; *Jangli hulvul,* DEC.; *Nay-kadughu,* TAM. *Kukha-avalu,* TEL.

A common weed, grows in Bengal and South India in the rainy season. The seeds yield a light, olive green-coloured limpid oil when subjected to a great pressure. It seems likely that this oil would prove serviceable where a very liquid oil is required. The plant is one of the commonest weeds in Bengal. The oil could be prepared to any extent.

CNICUS.

85 **Cnicus arvensis,** *Hoffm.*, COMPOSITÆ.

Vern.—*Bhur-bhur,* N. W. P.

Found throughout India, especially in cultivated fields in the Gangetic plains; the common thistle of India.

Produces small black seeds, which yield a large quantity of oil. The seeds are gathered by the poorer classes, and the oil expressed by them for their own use. It burns with smoke; it is otherwise of good quality.

COCHLOSPERMUM.

86 **Cochlospermum Gossypium,** *DC.*, BIXINEÆ.

Syn.—BOMBAX GOSSYPIUM, *Roxb.*

Vern.—*Kúmbi, gabdi, ganiár, galgal, gangal,* HID.; *Gangam,* GOND.; *Gúngú, kong,* TEL.; *Tanaku, kongillam,* TAM.; *Ganeri, gunglay,* MAR.

A small, deciduous tree of the forests at the base of the North-West Himalaya, from the Sutlej eastward, Central India, Deccan, and Prome district in Burma.

It is mentioned as an oil-yielding plant, but further information is wanted.

COCOS.

87 **Cocos nucifera,** *Linn.*, PALMEÆ.

THE COCOANUT TREE.

Vern.—*Narikel,* BENG.; *Nariel,* HIND.; *Tenna,* TAM.; *Nari kadam,* TEL., *On,* BURM.

A pinnate-leaved palm, cultivated and wild throughout tropical India, particularly near the sea-coast.

The pulp, dried at ordinary temperatures, contains 5·43 per cent. of oil. The method of extracting this oil in India, especially when the oil is required to be colourless, is as follows:—The kernel is boiled with water for a few minutes, then grated and placed in a press. The emulsion thus obtained is boiled until oil is found to settle on the surface. The ordinary commercial oils are manufactured by the rude oil-mills worked by oxen. The oil is white and nearly as fluid and limpid as water in tropical climates. It has a sweet and agreeable odour when fresh, but it is liable to become rancid in a short time. In Europe, the oil is chiefly used in the manufacture of candles and soap. In India it is used in cooking, and as medicine when fresh, and for burning, painting, soap-making, and anointing the body when rancid.

COLCHICUM.

88 **Colchicum illyricum,** LILIACÆ.

Vern.—*Súringán, talkh, shírín.*

Mr. Baden-Powell mentions this as an oil-yielding plant. Further information is required. There seems to be some mistake about the determination of the plant.

The oil is stated to have been obtained from Jalandhar, Lahore, Ludhiana and Kashmir. Specimens of the oil, as also the plant from which prepared, should, if possible, be procured from the Punjab.

CONNARUS.

89 **Connarus nitidus,** *Roxb. in Hort. Beng. 49,* CONNARACÆ.

Found in Sylhet and British Burma

Dr. McLelland says that in Rangoon seeds of this plant yield a quantity of sweet oil. The name **C nitidus** is not referred to by the *Flora of British India,* but I presume the plant which yields the oil in question is really **C. gibbosus,** *Wall.* Specimens of the oil should be supplied by Burma, accompanied with a twig of the plant, to allow of its being determined.

90 **C. speciosus,** *McLell.*

Vern.—*Gwedauk, Kadot, Kodet,* BURM.

A large tree of Rangoon, Pegu and Tounghoo.

McLelland says that the seeds yield an abundance of sweet oil.

The above has been extracted from **Dr. Cooke's** *Report on Oil Seeds.* The name **C. speciosus,** *McLell.,* was taken from *Balfour's Cyclopædia* and is one of the numerous fanciful namesused in that work which have never been published. **Dr. Cooke** eumvedaeineome doubt regarding this plant —a doubt which time has not rerma s. Abs dttely nothing is known regarding it. Information from Burma should, therefore, be obtained regarding the *Gwai-doak,* and, if possible, a sample of the oil and a twig of the plant should be supplied. The Burmese name *Gwe* **(Spondias magnifera)** seems very near to the above.

91 **Cooawanoo oil.**

This oil is procured from the reptile **Caouana divacea** in the East Indies.

CORIANDRUM.

92 **Coriandrum sativum,** *Linn.,* UMBELLIFERÆ.

THE CORIANDER.

Vern.—*Dhanyaka,* SANS.; *Dhania,* BENG., HIND.; *Kothamira, dhana* (seed) MAR.; *Kotamalli,* TAM.; *Danyalu,* TEL.; *Nan-nan,* BURM.

This plant is cultivated all over India.

The fruits of this plant yield, from 0·7 to 1 1 per cent of volatile oil by distillation in water. The oil is colourless or yellowish, with the odour and the flavour of Coriander.

CORNUS.

93 **Cornus macrophylla,** *Wall.*

Vern.—*Kasir, kachír, haleo, allian, haddú, naug, kaksh, kachúr, ruchi a* HIND.; *Patmoro,* NEPAL.

A doubtfully distinct species from the preceding; is common all along the Himalaya. I found it in the Naga hills and Manipur.

CROCODILE OIL.

It would be interesting to know if this also yields the oil, as it must if **Brandis'** observation proves correct. The knowledge of the oil may, however, be confined to Kashmir.

94 **Cornus sanguinea,** *Linn.*, CORNACEÆ.

A shrub or small tree found in Europe, Siberia and Kashmir, 7,000 feet altitude.

The pericarp of the fruit contains oil (*Brandis*). Specimens of this oil, with further information, should be obtained from Kashmir.

CORYLUS.

95 **Corylus Colurna,** *Linn.*, CUPULIFERÆ.

THE INDIAN HAZEL NUT.

Syn.—C. LACERA, *Wall*, C. JACQUEMONT, *Dcne.*

Vern.—*Curri*, NEPAL; *Langura*, BHUTI; *Shirol*, GARHWAL; *Urni*, *winri*, *thangi*, *jangi*, *shúrli*, *banpálu*, *kapasi*, *bhotia badam*, HIMALAYAN NAMES. *Findák*, the PB. name for the nuts.

A moderate sized tree of the North-West Himalaya, between altitude 5,500 and 10,000 feet.

The kernel of the European Hazel, **C. Avellana,** *Linn.* yields a sweet oil. There seems no reason to doubt that this oil could be prepared from the Indian species, but I can find no mention of it. Information on this subject would, therefore, be most acceptable. In the Eastern Himalaya the place of **C. Colurna** is taken by **C. ferox,** a Nepal and Sikkim species.

COSTUS.

96 **Costus speciosus,** *Sm.*, SCITAMINEÆ.

Vern.-*Kúst*, *keú*, BENG., HIND.; *Gudúrichákánda*, *kemuka*, BOM.; *Bomma kachika*, TEL. *Tsjana-kua*, MAL., *Kemúka*, SANS.

One of the most elegant plants of this family; its spirally-twisted stem carries its glossy leaves and white flowers above the brushwood in our tropical jungles. It is common everywhere throughout India, especially so in Bengal, frequenting moist, shady places. The rhizomes are made into a preserve, eaten by the natives. **Piesse** says of it: "I have made some experiments with a sample of *kúsht;* it appears to be scarcely as odorous as Orris Root. The tincture has an agreeable smell, and would be useful but no quantity has as yet been seen in our markets." An unlimited quantity might easily enough be exported from Bengal were some effort made to bring this root before the perfumers of Europe. There is a strong probability however that **Piesse** is referring to the root of **Saussurea Lappa** or **Hypoluca** members of the **Compositæ** which were formerly called **Aucklandia Costus.** It is remarkable that while associated with the word **Costus** both these widely different plants should have the same vernacular names as it would be interesting to know which actually possess the odour resembling the Orris, a plant nearer allied botanically to **Costus speciosus** than to **Saussurea.**

[148-50] **Cotton seed.** *See* **Gossypium.**

97 **Crocodile oil.**

The oil of the Indian Crocodile contains a larger quantity of solidifiable fat than either neat's-foot or any fish oil. It is prepared by the Sanif tribe, in the Punjab, who eat crocodile-flesh. It is said to be procurable in abundance at Agra. Specimens of this oil, also information regarding the mode of preparation, the amount annually procurable, and the economic uses of it, should be obtained from the North-West Provinces.

CROTON.

Croton oblongifolius, *Roxb.*, Euphorbiaceæ. 98

Vern.—*Arjunna,* Oudh *Ach,* Nepal *Parokupi,* Ass. *Ganasúra,* Mar; *Bhutan kusam,* Tel.; *Thétyin,* Burm.

A small tree found in the Sub-Himalayan tract, from Oudh eastward to Burma, also in South India and Ceylon.

The seeds give an oil. (*Gamble.*) Specimens of this oil-yielding nut should be supplied to allow of experiments being performed; also full information of the quantity annually available.

C. Pavana, *Hamilt.* 99

Vern.—*Thet-yén-ni,* Burm.

A tree of Assam and Burma.

It yields an oil, very similar to the Croton Oil of commerce. This oil is at present but imperfectly known, and it is therefore very desirable that Burma and Assam should each supply, say, a maund of the nuts, with specimens of the oil, and information regarding its preparation, and the quantity of nuts and oil annually obtainable. It is said to be plentiful at Ava and at Kamrúp.

C. Tiglium, *Linn.* 100

The Purging Croton.

Vern.—*Jayapála,* Sans.; *Jaypál,* Beng.; *Jamal-gota,* Hind.; *Jamalagota,* Mar; *Nervalam,* Tam.; *Nepala-vitua,* Tel.; *Kanako,* Burm.

A small tree (15 to 20 feet) indigenous to the Malabar coast and Tavoy, and found cultivated in gardens in Bengal, South India, Ceylon, Burma, the Indian Archipelago, the Moluccas, and even in Mauritius. (*Spons' Encycl.*)

It yields an oil which is orange yellow or sherry-coloured, of the consistence of nut-oil, with a slight odour resembling that of jalap resin, and an acrid flavour. This is a valuable medicinal oil, which is used as a drastic purgative. The oil, as prepared in India, is so much adulterated, that it finds no sale in Europe. The nuts are exported chiefly from Bombay and Cochin, and the oil is expressed by a firm in England.

It is necessary to be cautious in handling the nuts or oil, owing to their blistering the skin. The oil is frequently used externally for colds in the chest as an external application, causing a severe blister. It is much resorted to as a domestic cure but not recommended by the profession.

CUCUMIS.

Cucumis Melo, *L.*, Cucurbitaceæ. 101

The Sweet-Melon.

Vern.—*Kharmuj,* Beng.; *kharbúja, Khurbúj,* Hind.; *Kharabúja, chibúda,* Bom.; *Gidhro,* Sind.; *Vellari-verai,* Tam.; *Mulampandu,* Tel.

Extensively cultivated in the North-West Provinces, in the sandy basins of the rivers, on account of its fruit.

The flattened and elliptic seeds yield a sweet, edible oil. In fact, the seeds of most of the members of the Melon, Pumpkin, Cucumber, and Gourd family, contain oil, but the only kinds which are utilised to any considerable extent are those of the Sweet-melon (**Cucumis Melo**) and the Water-melon (**Citrullus vulgaris**). From West Africa large quantities of melon seeds are exported to France. China also does a large trade in them, but in India the fruit is chiefly eaten as such, and not allowed to ripen its seeds for the oil supply.

102 **Cucumis Melo,** *L. forma* MOMORDICA (*sp. Roxb.*)

Vern.—*Phunti,* BENG.; *Phut, túti,* HIND.; *Kakari-kai,* TAM.; *Pedda-kai, pedda dosray,* TEL.

There are two varieties, one appearing in the rains and the other in the hot season.

The seeds yield an oil.

103 **C. Melo,** *L. forma* UTILISSIMUS. (*sp. Roxb.*)

Vern.—*Kankri,* HIND. or *Kakri,* BENG.; *Dosray,* TEL.; *Kákadi,* BOM.

Cultivated in Upper Bengal and North-West Provinces during the hot weather and the rains.

The seeds yield an oil.

104 **C. sativus,** *Linn.*

THE CUCUMBER.

Vern.—*Sasa,* BENG.; *Khira,* HIND; *Kákadi, khira,* BOM.; *Muluvelari,* TAM.; *Dorga-kaia,* TEL.; *Khyar,* PERS.; *Thagwa,* BURM.

"There are two forms of this plant, one a creeping plant cultivated in the fields during the hot season, and the other a climber cultivated in homesteads in the rains. The fruits of both are extensively used as food." (*Amsterd. Cat.*)

The seeds yield an oil.

105 **C. trigonas,** *Roxb.*

Syn.—BRYONIA CALLOSA, *Herb. Rottl.*

Vern.—*Bislómbi,* HIND; *Rattut-tumatti,* TAM; *Adavi-puch-cha,* TEL.

Found throughout India.

"Dr. **Ainslie** remarks that the seeds yield a fixed oil by boiling, which is used for lamps by the poorer classes. **Lieutenant Hawkes** reports that it is used for burning in lamps in some parts where the fruit abounds.

"It is extracted by boiling in water, and is procurable only in small quantities." (*Cooke.*)

CUCURBITA.

106 **Cucurbita maxima,** *Duchesne,* CUCURBITACEÆ.

THE GOURD.

Vern.—*Kadu,* HIND.; *Lal-Bhopala, lal dudiya,* BOM; *Pushini-kaia,* TAM.; *Gummaddikaia,* TEL.; *Shwé pay ôn,* BURM.

Cultivated all over India for its fruit.

The seed yields an oil.

107 **C. Moschata,** *Duchesne.*

THE MUSK MELON.

Syn.—**C.** MELOPEPO, *Roxb.*

Vern.—*Kharbúj, saphari kumhra.*

The seed yields a mild, bland, pale-coloured oil.

108 **C. Pepo,** *DC.*

THE WHITE GOURD.

Vern.—*Kumra, Safed kaddu, lanka, kumra kumara, kadímah,* BENG., HIND; *Safed-Bhopala, safed-dudiya,* BOM.

Cultivated for its fruit.

Its seeds yield a clear edible oil.

Refer to **Benincasa cerifera** and compare with the remarks given under that species.

CUMINUM.

Cuminum Cyminum, *Linn.,* UMBELLIFERÆ. 109

Vern.—*Jiraka,* SANS.; *Jira,* BENG.; *Zira,* HIND; *Siragam,* TAM.; *Jiraka,* TEL.

Extensively cultivated in Rajputana and other parts of Upper India.

An oil is obtained from the seed, and is used medicinally as a stimulant and carminative.

CYDONIA.

Cydonia vulgaris, *Tourn.,* ROSACEÆ. 110

THE QUINCE.

Vern.—*Bihi,* HIND.; *Bamtsunt, bamsutu,* KASHMIR.

Cultivated in Afghanistan and the North-West Himalayas up to 5,500 feet.

Baden-Powell mentions this as an oil-yielding plant in his *List of Punjab Products.* **Docynia indica,** *Dcne.,* a nearly allied plant, is very plentiful in Sikkim, Bhutan, Khâsia hills, and Burma. In the Naga Hills the ground at certain seasons is simply covered with the fruit left in maunds to root under the trees. This might easily enough be put to some economic use.

CYNOMETRA.

Cynometra cauliflora, *Linn.,* LEGUMINOSÆ. 111

Vern.—*Iripa,* MAL.

A tree of the Western Peninsula, South India, Ceylon, and Malacca.

Its oil is said to be prepared in North Arcot, and used for medicinal purposes. Madras should supply specimens.

C. *sp.* **? polyandra,** *Roxb.* 112

Vern.—*Ping,* CACHAR.

Spons' Encyclop. says that the oil which this plant yields is medicinal.

C. ramiflora, *Linn.* 113

Vern.—*Shingr,* BENG.; *Irapû,* TAM.; *Myeng Kabeng,* BURM.; *Tripa,* MAL.; *Gal-mendora,* CINGH; *Iroopoo,* KAN.

Western Peninsula, Malabar, Ceylon, and common in the Sunderbuns.

The seed yields an oil which is externally applied in leprosy and other cutaneous diseases.

Ceylon or Madras should supply specimens.

CYPERUS.

Cyperus rotundus, *Linn.,* CYPERACEÆ. 114

Vern.—*Mutha,* BENG., HIND.; *Kori-ki-jhar,* DEC.; *Koray,* TAM.; *Sakhatungu-veru,* TEL.

Found everywhere in India, especially in Bengal.

The rounded rhizomes yield an essential oil, which the natives of Upper India use to perfume their clothes.

DALBERGIA.

115 **Dalbergia lanceolaria,** *Linn.*, LEGUMINOSÆ.

Syn.—D. FRONDOSA, *Roxb.*

Vern.—*Takoli, bithúa,* HIND.; *Bander siris,* NEPAL; *Nal valanga,* TAM.; *Pedda sopara, yerra pâtsaru,* TEL.; *Dandons,* MAR.

A deciduous tree of the Sub-Himalayan tract, from the Jumna eastward, ascending to 2,500 feet, and extending to Central and South India.

The oil expressed from the seed is used in rheumatic affections.

116 **D. latifolia,** *Roxb.*

THE BLACKWOOD OR ROSE WOOD OF SOUTHERN INDIA.

Vern.—*Sitsal,* BENG., NEPAL, OUDH; *Shisham, sisu, kalarukh,* MAR.; *Sissú,* GUZ.; *Iti, eruvadi,* TAM.; *Jitegi, jitangi,* TEL.

A deciduous tree, attaining a large size in South India, met with also in Oudh, East Bengal, and Central India.

The seeds yield oil of which almost nothing further than this fact is at present known.

Specimens of this as of the other oils from **Dalbergia** are required.

117 **D. Sissoo,** *Roxb.*

THE SISSOO.

Vern.—*Shisham, sissu, sissai,* HIND.; *Táli, safedar,* PB.; *Sissái,* OUDH; *Yette,* TAM.

A large, deciduous tree of the Sub-Himalayan tract, from the Indus to Assam, ascending to 3,000 feet. It is now largely cultivated throughout the plains of India as an ornamental tree along roads, &c.

It yields an empyreumatic, medicinal oil.

DAUCUS.

118 **Daucus Carota,** *Linn.*, UMBELLIFERÆ.

THE CARROT.

Vern.—*Gájar,* BENG., HIND.; *Gájjara kelangu,* TAM.; *Gajjara gadda,* TEL.

Cultivated in many parts of India. A hardy, acclimatised form, with almost green roots, is extensively cultivated in India, and is rapidly finding its way into the vegetable gardens of the natives. It is an exceedingly coarse form, but quite hardy in Behar, growing right through the hot season.

The seed yields an oil, but no information exists as to its nature.

DICHOPSIS.

119 **Dichopsis elliptica,** *Benth.*, SAPOTACEÆ.

Syn.—BASSIA ELLIPTICA, *Dalz.*

Vern.—*Panchoti pala,* TAM.; *Panchonta,* KAN.

A very large tree of the Western Ghâts.

It yields the "Gutta-percha Seed Oil."

120 **D. Gutta,** *Bth. & Hook. f.*, SAPOTACEÆ.

GUTTA-PERCHA.

Syn.—ISONANDRA GUTTA, *Hook.*

Vern.—*Niatoo,* MALAY.

A plant of Singapore and Borneo.

Reported by the Madras Jurors at the Exhibition of 1857 to yield oil.

DIOSPYROS.

Diospyros Embryopteris, *Pers.*, EBENACEÆ. 121

Syn.—D. GLUTINOSA, *Roxb.*

Vern.—*Gáb, makur-kendi,* BENG. and HIND.; *Kendu,* ASS.; *Tumbika, pani-chika,* TAM.; *Tumil,* TEL.; *Kusharta,* KAN.; *Timberee,* CINGH.

A small tree or large evergreen shrub, forming a dense dome of foliage, met with throughout India and Burma, especially in Assam, Bengal and Travancore.

An oil, extracted from the seed by boiling, is used in native medicine.

DIPTEROCARPUS.

Dipterocarpus lævis, *Ham.*, DIPTEROCARPEÆ. 122

Vern.—*Kanyin-ni,* BURM.

A lofty tree of the tropical forests, throughout Burma.

It yields a wood-oil used for painting. Full information as to the supply and economic uses of the Burmese wood oils, as also genuine specimens, are much required.

D. turbinatus, *Gaertn. f.* 123

Vern.—*Gurjun, tilyagurjun,* BENG.; *Kanyoung,* MAGH; *Kanyin-ni,* BURM.

A lofty, evergreen tree of Eastern Bengal, Chittagong, Burma, and the Andaman Islands.

It yields a wood-oil used in painting houses and ships.

D. zeylanicus, *Thwaites.* 124

Vern.—*Norá,* CINGH.

A tree of Ceylon, ascending to altitude 3,000 feet.

Yields wood-oil.

DOLICHOS.

Dolichos biflorus, *Linn.*, LEGUMINOSÆ. 125

Syn.—D. UNIFLORUS, *Lam.*; GLYCINE UNIFLORUS, *Lam.*

Vern.—*Kurti-kalai,* BENG.; *Kulthi gahat,* HIND.; *Kollu,* TAM.; *Wulawalli,* TEL.; *Kulitba gaglip,* SIND.

An erect annual (*forma uniflora*) or twining (*forma biflora*) plant, met with chiefly in a state of cultivation as a pulse crop on the tropical and subtropical Himalaya, to Burma and Ceylon.

The beans are said to yield an oil, of which little is known. They are chiefly used as food for horses.

DOREMA.

Dorema Ammoniacum, *Don,* UMBELLIFRÆ. 126

EASTERN GIANT FENNEL.

Ven.—*Ushak,* PERS., ARAB., BOM.; *Kandal,* BOKHARA.

A glaucous green plant, native of Persia.

It yields a volatile oil, said to be imported into India. The available information on this subject is exceedingly meagre, and the above reference is given chiefly with the view of suggesting enquiry, as I suspect the plant to be a species of **Ferula**. *See* **Fæniculum** and **Ferula.**

DRYOBALANOPS.

127 **Dryobalanops Camphora,** *Colebr.*, DIPTEROCARPEÆ.

Vern.—*Barás Camphor, barásakápúra, bhímsenikápura,* BOM.

It yields a volatile oil, which is largely used in Singapore as a substitute for turpentine. *See* **Camphor.**

128 **Dugong oil,** or the oil of the SEA HOG,—the YUNGAN OR MOODA HOORA.

There are two species, each yielding an oil of great value in medicine and cooking. One of the species, **Halicore indicus,** is distributed throughout the Indian Ocean, in the Gulf of Manaar, on the west coast of Ceylon, in the Straits Settlements and the Eastern Archipelago. The other species, **H. australis,** is found on the Australian coasts.

On boiling down, each animal, weighing from 4 to 6 cwts., yields from 6 to 14 gallons of oil. The oil has no unpleasant flavour; it is free from odour; when refined it is clear and limpid. It is largely used as a substitute for cod-liver oil. (*Spons' Encyclop.*)

ELETTARIA.

129 **Elettaria Cardamomum,** *Maton*, SCITAMINEÆ.

THE LESSER CARDAMOM.

Vern.—*Chota-eláchi,* BENG., HID.; *Ellaay,* TAM., TEL.; *Pala,* BURM.

Extensively cultivated in the hilly districts of India.

Baden-Powell mentions this plant in his list of medicinal oils. I am not aware of a fatty oil being expressed from the Cardamoms, and it seems probable that the oil referred to by **Mr. Powell** was merely Gingelly Oil medicated with Cardamoms.

An essential oil is extracted by aqueous distillation. It is of a pale yellow colour, about 5 per cent. being generally obtained; it possesses the flavour and odour of Cardamoms, and is said to be distilled to some extent in Madras.

ENTADA.

130 **Entada scandens,** *Benth.*, LEGUMINOSÆ.

Syn.—E. PURSÆTHA, *DC.*; MIMOSA SCANDENS, *Roxb.*

Vern.—*Gilla,* BEG.; *Geredi,* URIYA; *Pangra,* NEPAL; *Gardal,* BOM.; *Gán nyin,* BURM.

A large climber of the forests of Eastern Bengal, South India, Burma, the Andaman Islands and Ceylon, ascending on the Himalaya to altitude 4,000 feet.

An oil is said to be expressed from the seeds of this plant, the properties of which are not known. In the Naga Hills the plant is exceedingly common, its pods, often 3 to 5 feet long, forming a most remarkable feature of the lower forests, especially on the Assam side.

Information as to the oil might therefore be obtained from Assam; and samples of the oil, pods, and seed, and information as to its extraction and economic uses, would be most acceptable. Specimens of snuff-boxes made from the seeds are much rcequired.

ERIODENDRON.

Eriodendron anfractuosum, *DC.*, MALVACEÆ. 131

THE WHITE COTTON TREE.

Syn.—E. ORIETALE, *Stend.*; BOMBAX PENTANDRUM, *Roxb.*

Vern.—*Safed simal, senibal, natian, katan,* HIND.; *Shwet simul,* BENG.; *Ilavam,* TAM.; *Buruga, pur, kadami,* TEL.; *Imbul,* CINGH.

A tall, deciduous, soft-wooded tree of India and Burma, often planted Yields a dark brown, clear oil, which was exhibited at Madras in 1857. (*Cooke.*)

Madras might supply samples of this oil and give a brief notice of the mode of preparation and information of its economic use.

ERUCA.

Eruca sativa, *Lam.*, CRUCIFERÆ. 132

Vern.—*Taramira,* HIND.; *Assu,* PB.

Cultivated places in North and Central India, Western Himalaya, ascending to 10,000 feet, also met with in the Upper Gangetic valley.

Roxburgh says that it is cultivated during the cold season for the seed, from which oil is prepared by expression. It resembles colza oil in all respects but in colour.

Specimens of this oil, with further information, are much required, in order to establish its relation to Mustard and Colza. The oil is used for burning purposes and anointing the hair and to a certain extent in food.

ERYTHROXYLON.

Erythroxylon monogynum, *Roxb.*, LINEÆ. 133

Vern.—*Devadarú,* TAM.; *Adivigeranta,* TEL.

A small tree of South India, the Western Peninsula, and Ceylon.

The wood is reported to yield an oil used as a preservative for native boats.

Madras might be able to supply a specimen of this oil, also specimens of the plant to allow of its identification. Information as to the mode of preparation would also be interesting.

EUCALYPTUS.

Eucalyptus Globulus, *Lab.*, MYRTACEÆ. 134

THE BLUE GUM.

Vern.—*Kurpoora maram,* MAD.

A lofty tree, with fibrous deciduous outer bark, gregarious in Victoria and the south of Tasmania; introduced on the Nilgiris, and now almost naturalised. Good specimens are to be seen in our Botanic Gardens, especially at Lucknow.

The leaves of the plant yield an essential oil used in medicine. Recently this has been used in the preparation of Eucalyptus Soap, much advertised.

EUPHORBIA.

135 **Euphorbia dracunculoides,** *Lam.*, EUPHORBIACEÆ.

Syn. - E. LANCEOLATA, *Rottb.*

Vern.—*Jy chee, chhagul-puputi*, BENG.

A much-branched annual, met with in the Punjab, Bengal, Madras (Coromandel) and Konkan.

It yields an oil, limpid, clear, of a yellowish or greenish yellow colour, used as a drying oil and for burning. In 1843 it was submitted to London brokers who pronounced it more valuable than linseed oil. The *Agri-Horticultural Journal, India, ii, p. 52, 1843*, draws attention to this oil.

EXCÆCARIA.

136 **Excæcaria sebifera,** *Müll. Arg.*, EUPHORBIACEÆ.

THE CHINESE TALLOW TREE.

Syn.—SAPIUM SEBIFERUM, *Roxb.*

Vern.—*Mom-china*, BENG.

A moderate-sized tree, cultivated in China and Japan, where it is probably indigenous. Cultivated or naturalised throughout North India. It is reported to thrive in the North-West Provinces and the Punjab, especially at Paonee, Ayar Tali, Kumaun and Kangra Valley.

The seed yields an oil, described as a white and solid tallow, very pure and inodorous; exhibited at the Punjab Exhibition, and used in the manufacture of candles.

The fruits are about ½ inch in diameter and contain a thick coat of fatty matter around the seeds, whence the tallow is obtained. The fruits are collected at the commencement of the cold weather. After being cleansed and freed from the shell, they are steamed and finally subjected to a dry heat in sieves when the tallow melts and is collected in masses. It is then subjected to various processes to free it from impurities, being squeezed through a press as the final refining process. When purified it is hard, opaque, white, tasteless and inodorous. The fat is much used in China for candles. From the kernels, after removal of the tallow, an oil is prepared which is used in China to varnish umbrellas, to anoint the hair, and also medicinally.

FERONIA.

137 **Feronia Elephantum,** *Corr.*, RUTACEÆ.

Vern.—*Bilin, kait, katbel*, HIND.; *Kathbel*, BENG.; *Kavatha, katori*, SIND; *Vallanga, vela, kairt*, TAM.; *Velaga, yellanga*, TEL.; *Hman*, BURM.

A large tree of the Sub-Himalayan forests from the Ravi eastward, Bengal, South India, and the Chanda district in the Central Provinces.

The seed has been mentioned as yielding an oil, but beyond this nothing is known.

FERULA.

138 **Ferula Narthex,** *Boiss.*, UMBELLIFERÆ.

Syn.—NARTHEX ASAFŒTIDA.

Vern.—*Hingu*, SANS.; *Hing*, BENG., HIND.; *Perungayam*, TAM.; *Inguva*, TEL.

The Asafœtida plant is a native of Kashmir, Persia and Afghanistan. The root contains an essential oil.

FLACOURTIA.

Flacourtia Cataphracta, *Roxb*., BIXINEÆ. 139

Vern.—*Paniala, panisali*, BENG.; *Talispatri, paniala*, HIND.; *Jangama, támbata*, BOM.; *Talisapatri*, TAM., TEL.; *Nay-wé*, BURM.

A small tree, with the lower half of its stem very spiny, found in Bengal, Burma, Bombay, and Western Ghâts.

The seeds yield an oil. This is one of the most plentiful trees of India. Information regarding its oil might lead to the opening up of a trade in an article which even the poorest might supply.

FŒNICULUM.

Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ. 140

THE COMMON FENNEL.

Syn.—F. PANMORIUM, *Roxb.*; ANETHUM PAMORI, *Roxb.*

Vern.—*Mauri, pan-muhori*, BENG.; *Sont*, HIND.; *Madhúriká*, SANS.; *Sohikire*, TAM.; *Pedda-jila-kurra*, TEL.

Cultivated in most parts of India as a cold season crop, on account of its grain, which is often eaten in *pán*.

The grain contains a volatile oil, pale yellow, with a pleasant aromatic odour. Fennel water is used medicinally, but chiefly as a vehicle for other drugs. This water is distilled largely in India and sold under the name of *Arak bádián*.

GARCINIA.

Garcinia indica, *Choisy*, GUTTIFERÆ. 141

COCUM or KOKUM BUTTER.

Syn.—G. PURPUREA, *Roxb.*; G. CELEBICA, *Desr.*; BRINDONIA INDICA, *Dupotit.*

Vern.—*Moorgul mara*, TAM.; *Kokum, Ratámbi*, the fruit *kokama, amasúla, brindáo*, BOM.; *Brindao*, GOA. The BRINDALL of the Portuguese.

Found on the Ghâts of Konkan and Kanara.

The seeds yield an oil, white or pale greenish-yellow, solid, rather friable, with a faint but not unpleasant smell, soluble in ether, and slightly so in rectified spirits; recommended for many medicinal purposes. The seed is pounded in a mortar, and when reduced to a mass the whole is boiled in water, when the oil rises to the surface, and is skimmed off; on cooling it hardens, and is roughly moulded into egg-shaped lumps or into concavo-convex cakes. The *Flora of British India*, in keeping with all previous works, gives the statement that **Cocum** or Gamboge Butter is extensively used to adulterate ghee; but speaking of this subject, **Dymock**, in his valuable work on the Materia Medica of Western India, says this statement is incorrect. He explains that the Christians obtain their ghee from pigs and the Hindus import theirs from Bombay. The existence of a scarcity would seem to point to adulteration being extremely probable. The statement made by most authors that it is used as an adulterant with ghee is not confined to Goa.

Additional information would be exceedingly interesting, as also specimens of the **Cocum Butter** from different parts of India.

142 **Garcinia Morella,** *Desr.*

THE GAMBOGE TREE.

Vern.--*Aradal, punar puli,* KAN.; *Mukki,* TAM.; *Revachinni,* MAR.; *Thanotaw,* BURM.; *Gota gamba,* HIND., for the gum-resin.; *Gokatú, kanagoraka,* CINGH.

An evergreen tree of the forests of the Khásia Hills, East and West Bengal, and Ceylon.

It yields a semi-solid fat of a yellow colour, used as a lamp oil by the rich and by the poor as a substitute for ghee, much in the same way as the preceding, and in fact indiscriminately with it.

143 **Ghee** or clarified butter, largely made from buffalo's milk and cow's milk, is universally employed in domestic cooking in India, and is an imdrotant article of local trade. See **Garcinia indica,** and also **Lard.**

144 **Ghirgilly Oil from Kanara.**

This oil is mentioned by **Balfour**; no further information is available.

145 **Ginger Grass.**

An essential oil is obtained from **Andropogon Schœnanthes,** which see.

GIVOTIA.

146 **Givotia rottleriformis,** *Griff,* EUPHORBIACEÆ.

Vern.—*Vendale, butalli, bulali,* TAM.; *Tella púnki,* TEL.

A middle-sized tree of Mysore, the Deccan, the Eastern Ghâts and Ceylon.

The seeds give an oil, locally used for lubricating machinery. (*Gamble.*)

GLYCINE.

147 **Glycine Soja,** *Lieb.,* LEGUMINOSÆ.

THE SOY BEAN.

Syn.—DOLICHOS SOJA, *Linn.*; SOJA HISPIDA.

Vern.—*Gari-kulay,* BENG. : *Bhat, bhatwan,* HIND.

A pulse (densely clothed with fine ferruginous hairs) sub-erect. Tropical regions and outer Himalaya, from Kumaun to Sikkim, the Khásia and the Naga Hills to Upper Burma. **Dr. Stewart** mentions a field of *Bhat* having been observed in Bissahir in the Punjab, altitude 6,000 feet. It is chiefly met with in a state of cultivation. **Dr. Roxburgh** first saw the plant from seed received from the Moluccas in 1798.

The seed or bean has almost attained a European name from its being used to make the sauce known in India as "Soy." The seed is largely eaten by the Chinese, and from it a sort of cheese is prepared. It is also largely consumed in the manufacture of an edible oil. The cake, after the extraction of the oil, is used as food for cattle or as a rich manure.

GOSSYPIUM.

148 **Gossypium arboreum,** *Linn.,* MALVACEÆ.

149 **G. barbadense,** *Linn.*

150 **G. herbaceum,** *Linn.*

THE COTTON.

Vern.—*Karpas,* SANS.; *Tula,* BENG.; *Rui,* HIND.; *Parutti,* TAM.; *Paritt,* TEL.; *Wa,* BURM.

Cultivated in India.

The various species of cotton yield an oil, dark and turbid when crude, but capable of being refined into a clear, amber-coloured oil, used for burning in lamps, and also medicinally as a demulcent.

Gourd. *See* **Cucuribta maxima.** [186]

Ground Nut. *See* **Arachis hypogea.** [25]

GUIZOTIA.

Guizotia abyssynica, *Cass*, COMPOSITÆ. 151

NIGER SEED AND OIL.

Syn.—G. OLEIFERA, *DC.*

Vern.—*Kala-til,* HIND.; *Ram-til,* BENG.; *Rámatila, kerani,* BOM; *Valesuloo,* TEL.

Cultivated in India. Originally a native of Africa.

It yields a limpid, clear, pale, sweet-tasted oil, used for culinary purposes. It is plentiful in the Mysore, Vizagapatam, and Ganjam districts. It is often used as a substitute for gingelly, and is the common lamp oil of Upper India; it is very cheap. It is generally sown in July or August and ripens in three months, the yield being about 2 bushels per acre. **Colonel Sykes** remarks that this is largely used in the Deccan as a substitute for ghee by the poorer cultivators. The cake is a much-prized food for milk-cows. **Mr. Solly** reported that the yield was about 35 per cent., or about 10 per cent. less than the yield from Sesamum (gingelly.)

Further information and facts as to exportation to Europe required; also samples of oil and seed.

GYNOCARDIA.

Gynocardia odorata, *R. Br.*, BIXINEÆ. 152

THE CHAULMUGRA OIL.

Vern.—*Chaulmicgri, petarkura,* BENG.; *Kadu,* NEPAL; *Túk,* LEPCHA; *Toung-pung,* MAGH; *Lukrabo-oil,* SIAM; *Ta-fung-tse-of,* CHINA.

A moderate sized, evergreen tree of North and East Bengal, Assam, Khásia Hills, Chittagong and Burma. It has a large fruit, somewhat like an orange, in the pulp of which the seeds are imbedded.

"The seeds give by expression about 10 per cent. of a thick, fixed oil, of unpleasant flavour and rather offensive smell." (*O'Shaughnessy.*)

The oil is extracted by both cold and hot expression, the yield being about 10 per cent. It is used by the natives in the treatment of cutaneous diseases.

The pure oil can hardly be obtained in India. It has recently been largely introduced into European practice in the treatment of rheumatism, rheumatic gout, phthisis and various skin diseases. It is much advertised by **Mr. T. Christy** in his *New Commercial Plants.* European practitioners in India do not seem to attach much value to the oil, and I am told by one of our leading druggists that this opinion has been arrived at after careful investigation with carefully-prepared specimens of the oil.

Additional information and specimens of the oil and seed are much required.

HELIANTHUS.

153 **Helianthus annuus,** *Linn.*, COMPOSITÆ.

SUNFLOWER.

Vern.—***Surajmukhi,*** HIND.; ***Suria-mukhi,*** SANS.; *Aditya, bhakti-chettu,* ***podda-trin-gudda chettu,*** TEL.

Cultivated in Indian gardens during the cold season.

It yields a clear, fluid oil, resembling that of the ground nut. I have seen good specimens prepared at one or two of our jails in Bengal.

Specimens and additional information required.

HERITIERA.

154 **Heritiera littoralis,** *Dryand.*, STERCULIACEÆ.

Vern.—***Sunder, sundri,*** BENG.; ***Pinle kanaso,*** BURM.; ***Mawtda,*** AND.

A small, gregarious, evergreen tree of the coasts and tidal forests of Bengal, the Eastern and Western Peninsula, Burma, Khásia Hills, the Andaman Islands and Ceylon.

This tree is reported as the source of an oil in the Antilles, the use of which is not known.

HIBISCUS.

155 **Hibiscus abelmoschus,** *Linn.*, MALVACEÆ.

MUSK MALLOW.

Syn.– ABILMOSCHUS MOSCHATUS.

Vern.—***Kasture,*** BENG., SANS.; ***Mushkdáná,*** HIND.; ***Kalakasturi,*** DEC.; ***Kasturu-benda,*** TAM.; ***Karpura-benda,*** TEL.; ***Balu-waki,*** BURM.

An annual, found in the rainy season in many parts of India.

"The seeds called ***Musk mallow*** in English and ***hub-ul-mushk*** in Arabic, from its smell resembling a mixture of musk and amber, are used medicinally in chronic dyspepsia as a cordial and stomachic." (*Amsterd. Cat.*)

156 **H. cannabinus,** *Linn.*, MALVACEÆ.

Vern.—***Maestapat, mestapaut, nalku, pulooa,*** BENG.; *Palungoo,* TAM.; ***Gongkura,*** TEL.; ***Ambaree,*** DEC.; ***Punday, pundrika,*** KAN.; ***Sunnee,*** SAHARUNPORE; ***Pooley-numajee,*** COIMBATORE.

Generally cultivated in India.

The seeds of this plant have been frequently sent from India to England as an oil-seed, but the use of the oil is not known. It is clear and limpid.

157 **H. ficulnens,** *Linn.*

Vern.—***Ban-dhenras,*** BENG.; ***Parupu benda,*** TAM.

Grows in the hotter parts of India.

Lieut. Hawkes mentions this as one of the oils of South India.

Hibiscus Sabdariffa, *Linn.* 158

ROSSELLE.

Vern.—*Mesta, patwa,* BENG.; *Polechee,* MAL.; *Chinbaung,* BURM.

Generally cultivated in the hotter parts of India.

An oil is prepared from this plant at the Allahabad Jail, particulars as to the preparation and economic use of which are required.

HOLARRHENA. 159

Holarrhena antidysenterica, *Wall.*, APOCYNEÆ.

Syn.—H. PUBESCENS, *Wall.*; H. CODAGA, *Don*; ECHITES ANTIDYSENTERICA, *Roxb.*; CHONEMORPHA ANTIDYSENTERICA, *Don*.

Vern.—*Inderjau, dudhu-ki-lakri,* HIND.; *Vepali, veppaula, veppalay,* TAM.; *Kodoga-pala, pala-chettu,* TEL.; *Lettopgyi,* BURM.

A plant of the Sub-Himalayan tract, Oudh, Bengal, Central and South India.

It yields a thick, scarlet-coloured medicinal oil. In works on medical and economic science, great confusion for a long time existed with regard to this plant; the bark (*Connesi Bark*) and the seeds (*Inderjau*) having for a long time been attributed to an imaginary species, **Wrightia antidysenterica,** *Linn.* As this error has not even yet been eradicated, I take the present opportunity of repeating the characters by which **Wrightia** may be distinguished from **Holarrhena**:—

WRIGHTIA.	HOLARRHENA.
(1.) *Corolla* not more than twice the length of the calyx, mouth surrounded by a corona or teeth.	(1.) *Corolla* three or four times the length of the calyx; mouth naked.
(2.) *Stamens* inserted within the mouth of the corolla, anthers protruding, twisted and surrounded by the corona.	(2.) *Stamens* inserted at the bottom of the tube and therefore not protruding.
(3.) The *seeds* are straight, oblong, compressed with a coma of hairs at the base, the apex being pointed and naked.	(3.) The *seeds* are linear, oblong, compressed, concave, with a coma of hairs on the apex.

In **Alstonia,** a genus which has also been confused with the preceding, the seeds are attached to the fruit in the middle, and have a coma of hairs at both extremities. *See* **Wrightia.**

HURA.

Hura crepitans, *Linn.*, EUPHORBIACEÆ. 160

SANDBOX TREE.

A large tree introduced into India from Jamaica.

A clear, pale-coloured, fluid oil is obtained from the seeds, of which a sample was shown at the Madras Exhibition of 1857. The whole tree abounds in poisonous matter, and the oil may partake of its deleterious nature.

Madras might be invited to supply specimens of the oil, accompanied with a descriptive note of the mode of preparation and economic uses. Specimens of the seeds should also be supplied.

HYDNOCARPUS.

161 **Hydnocarpus Wightiana,** *Blume,* BIXINEÆ.

Syn.—H. INEBRIANS, *Wall.*

Vern.—*Yetti, maravetti,* TAM.; *Kowti,* MAR.; *Makúlú,* CINGH.

A common tree of the Western Ghâts and Western Coast.

"The oil, which is the produce of this plant, is employed on the Malabar Coast in cutaneous diseases and opthalmia, and for ulcers on the feet." (*Cooke.*)

Dr. Cooke, in his *Report on Oils and Oil-seeds,* mentions a few other species of **Hydnocarpus** such as **H. alpinia,** *Wight,* **H. castanea,** *Hook f. and Th.,* **H. venenata,** *Gaertn.,* **H. octandra,** *Thw.,* as oil-producing plants. Further information is required regarding these, and if possible Bombay should supply specimens of these oils and plants from which they have been prepared.

HYOSCYAMUS.

162 **Hyoscyamus niger,** *Linn.,* SOLANACEÆ.

A herbaceous plant of the temperate Western Himalaya, altitude 8,000 to 11,000 feet, common from Kashmir to Garwhal.

This plant is mentioned by **Dr. Cooke** as yielding an oil, of which further information is wanting.

ILLICIUM.

163 **Illicium Anisatum,** *Linn.,* MAGNOLIACEÆ.

THE SACRED STAR ANISE of China and Japan.

Vern.—*Bádiánkhatái* (fruit), BOM.]

The Sacred Star Anise tree is not met with in India, but we have two, if not three, allied species, chiefly on the Khásia and Naga Hills. One species I found, a giant of the forest of North Manipur and the Naga Hills, altitude 8,000 feet.

The fruit distilled with water yields an essential oil very much resembling that of aniseed.

IMPATIENS.

164 **Impatiens racemosa,** *DC.,* GERANIACEÆ.

A small, herbaceous plant, common on the temperate Himalaya, altitude 5,000 to 7,000 feet from Simla to Sikkim, often ascending in Sikkim to 12,000 feet.

It yields an oil which is used for burning, and is also edible.

165 **I. Roylei,** *Walp.*

A handsome bush, often 10 feet in height, common on the temperate Western Himalaya from Nepal to Marri, altitude 6,000 to 8,000 feet.

The raw seeds are edible, tasting like nuts; from them an oil is prepared.

166 **I. sulcata,** *Wall.*

A gigantic annual, often 15 feet in height, frequent on the temperate Himalaya, altitude 7,000 to 12,000 feet.

The seeds are edible and yield an oil.

Impatiens Edgeworthii, *Hook.* 167

Vern.—*Bantil, tatura, trual, pallu, tilphar, halu, fuk,* PB.

The seeds yield an oil, which is both eaten and burned by the inhabitants of the Upper Sutlej. It is probable that all the preceding species are used indiscriminately, and, as **Stewart** remarks, from the prevalence of the word *tél* in the names given for these, as also for other species, they all yield oil.

Specimens of these oils, with additional information, required.

INDIGOFERA.

Indigofera aspalathoides, *Váhl.*, LEGUMINOSÆ. 168

Vern.—*Shevenar-vaymbú,* TAM.; *Manneli,* MAL.

A low under-shrub of the plains of the Carnatic and Ceylon.

Ainslie says that an oil is obtained from the root, which is used to anoint the head in erysipelas. Much doubt exists regarding this oil, and specimens and further information, giving mode of preparation, should, if possible, be obtained. **Dr. Bidie**, in his list of drugs supplied to the Paris Exhibition, states that this is a common weed. If that be so, Madras might be able to supply specimens of both plant and oil.

I. tinctoria, *Linn.* 169

INDIGO.

Vern.—*Nil,* HIND; *Nila gula,* BOM.; *Nilam,* TAM.; *Nili-mandu,* TEL.

Extensively cultivated in Bengal, the North-West Provinces, Punjab, Sind and South India.

The dye is too well known to require more than a passing notice, but the oil is almost unknown, and this is largely because of the dye-crop being reaped before the plant has had time to form its fruit. The seeds yield, however, an oil said to be used medicinally by the natives. Specimens and further information required.

IRIS.

Iris florentina, *Linn.*, IRIDACEÆ. 170

THE IRIS, ORRIS ROOT.

This is the European plant so much used in the preparation of the sweetly-scented Otto of Orris. It is said to be sometimes met with in Indian gardens. **Stewart** says that in the Punjab the medicinal root *irisa* is supposed to be obtained from **I. florentina,** *Linn.* Probably he has incorrectly identified the species, since he states that it comes from Kashmir.

There are in all some six species of **Iris** met with on the Himalaya. I found one plentiful on the mountains of Manipur, which has not yet been identified. I am unable to discover whether the natives of India ever obtain from any of these an otto similar to Otto of Orris.

JASMINUM.

Jasminum grandiflorum, *Linn.*, OLEACEÆ. 171

THE SPANISH JASMINE.

Vern.—*Játi, chámbel,* HIND., BENG., and SANS.; *Chámbeli,* BOM.; *Jahi, chambeli,* KUMAUN; *Myatle,* BURM.

172 **Jasminum officinale,** *Linn.*

Vern.—*Chamba,* HIND; *Chamba, chirichog, kiri,* KASHMIR; *Bansu, kwer, dúmni,* CHENAB; *Dassi, samsem,* RAVI; *Suni,* SUTLEJ.

173 **J. Sambac,** *Aiton.*

THE ARABIAN JASMINE.

Vern.—*Múgra, chamba, bél, bun-mulika,* HIND. and BENG.; *Várshiki, ásphota,* SANS.; *Mográ,* BOM.; *Zambac,* PERS.; *Sabé, male,* BURM.

There are in India some 40 species of the genus **Jasminum,** nearly all of which might be used in the preparation of the otto and oil of Jasmine. The three preceding species are those most abundant, almost universally occurring in gardens in India. **J. Sambac,** the *Bél* of the Bengalis, is exceedingly plentiful, both single and double-flowered, and erect or climbing. Its flowers appear in the hot season, and are largely used as votive offerings. Oil of Jasmine is prepared from them.

J. officinale is cultivated in Europe and hardy in England. Often met with in Indian gardens, wild in Kashmir, altitude 3,000 to 9,000 feet.

J. grandiflorum seems to be the plant chiefly cultivated by the perfumers of Europe. It differs from the preceding in having the calyx rarely half the length of the corolla tube. The flowers are largely made into garlands.

The Oil of Jasmine is regarded as cooling, and is much used by the richer natives of India to anoint the body before bathing. An oil prepared with the juice of the leaves is poured into the ears in otorrhœa. (*U. C. Dutt.*)

The Otto of Jasmine is prepared in Europe by *enfleurage.* A mixture of lard and beef suet is spread on glass trays or frames fitting tightly in a rack, the one above the other. Over these prepared trays the fresh flowers are scattered, tray above tray. After standing for a day or so the flowers are renewed time after time throughout the flowering season of the plant. When impregnated with the sweet perfume the pomade is scraped off the trays, melted at a lowtemperature and strained. The perfume is extracted by pouring over the pomade pure rectified spirit, and leaving it to saturate for a fortnight. About two pounds of the pomade yield one quart of the spirit. (*Piesse, on the Art of Perfumery.*) An essential oil may be prepared by repeated distillation of the flowers in the same water.

Information regarding the Indian preparation of these oils is much required, also samples from different parts of India.

JATROPHA.

174 **Jatropha Curcas,** *Linn.,* EUPHORBIACEÆ.

THE PHYSIC NUT.

Vern.—*Bagberenda, páhári erand, safedind,* HIND., BENG.; *Kánana erand,* SANS; *Kadam,* NEPAL; *Mogalieranda,* BOM.; *Koat amunak,* TAM.; *Nepalam,* TEL.; *Thinbaw-kyetsu,* BURM.

A soft-wooded, evergreen shrub, indigenous to America, cultivated in most parts of India, especially on the Coromandel Coast and in Travancore.

The seeds yield about 30 per cent. of an oil somewhat paler in colour than the best linseed oil. The oil is used for burning in lamps. Medicinally, it is a powerful purgative and emetic, and is a useful application in cutaneous diseases and in rheumatism. Its action is, however, not uniform, and in large doses it is an acro-narcotic poison. It may be readily distinguished from castor oil by its being almost insoluble in alcohol.

Jatropha glandulifera, *Roxb.* 175

Vern.—*Addalay,* TAM.; *Nela-amida,* TEL.; *Lal-bherenda,* BENG.; *Jangali eranda,* BOM.; *Nikumba,* SANS. (These are given by Ainslie in the first instance as the South India names for a plant he calls **J. glauca,** *Vahl.*; this plant was subsequently referred to **J. glandulifera,** *Roxb.*, by surry in his *Useful Plants of India,* and through him the above name crept into all subsequent writings as the vernacular names for Roxburgh's plant.)

A shrub common near villages in Bengal, Burma, Northern Circars and the Deccan, rare in Oudh and the Punjab.

Yields a light, straw-coloured fluid oil, which very much resembles Castor oil in appearance. It is a stimulant and counter-irritant. Ainslie says that "from the seeds the Vytians (Hindu doctors) prepare, by careful expression, an oil which, from its stimulating quality, they recommend as an external application in cases of chronic rheumatism and paralytic affections".

J. mulifida, *Linn.* 176

THE CORAL PLANT.

An extensively-cultivated and ornamental plant, with much dissected leaves and flower tops somewhat resembling coral.

The seeds yield an oil, which has been known to produce alarming symptoms of poisoning.

JUGLANS.

Juglans regia, *Linn.*, JUGLANDEÆ. 177

THE WALNUT.

Vern.—*Akhrot,* HIND.; *Akrut,* BENG.; *Charmghz,* PERS.; *Akhor,* KASHMIR; *Kowal,* LEPCHA; *Tagashing,* BHUTIA.

A large tree, wild in the North-West Himalaya, largely cultivated in the hills.

The oil produced from the kernels of this plant is limpid, almost colourless, or pale yellow, sweet. They yield above 50 per cent., and it is stated that about ⅛ of the oil prepared in France is obtained from this plant. It is also largely expressed in Spain and Italy. In India it seems to be known to the hill traders only, and it is seldom, if ever, seen in the plains. It is prepared to a considerable extent in Kashmir.

Specimens of the oil and further information should, if possible, be obtained from Kashmir and Chumba.

KOKOONA.

Kokoona zeylanica, *Thwaites,* CELASTRINEÆ. 178

A tree with pale-coloured bark, met with on Western Peninsula and Ceylon.

Thwaites says that an oil is expressed from the seeds, which is used for burning in lamps.

LACTUCA.

Lactuca scariola, *Linn.*, COMPOSITÆ. 179

Var. sativa.

THE COMMON LETTUCE.

Vern.—*Kahu, sulád,* HIND.

Largely grown as a cold season garden vegetable.

The seeds yield a clear, transparent, sweet oil.

LAGENARIA.

180 **Lagenaria vulgaris,** *Seringe,* CUCURBITACEÆ.

THE BOTTLE GOURD.

Vern.—*Tumba, toombe, kaddu, kabuli,* HIND.; *Kodu, lau,* BENG.; *Kaddu, kabuli, laukī, tumba,* PB.; *Soriai-kai,* TAM.; *Sorakaya, kundanuga,* TEL.; *Bu,* BURM.

Extensively cultivated in many parts of India.

The seeds yield a clear, limpid oil, which, if externally applied, is said to relieve head-ache.

181 **Lard.**

The melted fat of swine. This substance is reported to be largely used in India as a substitute for ghee or as an adulterant. From lard is expressed a clear colourless oil, an esteemed lubricant, and largely used as an adulterant for olive oil in France and for sperm oil in America. *See* **Garcinia.**

LAWSONIA.

182 **Lawsonia alba,** *Lam.,* LYTHRACEÆ.

THE HENNA PLANT.

Syn.—L. INERMIS, *Linn.*

Vern.—*Henna, mhendi,* HIND.; *Manghati,* URIYA; *Manthondi,* TAM.; *Gorante,* KAN., TEL.; *Mendi,* BOM.; *Dan,* BURM.

A small, elegant and sweetly-scented bush, wild in Beluchistan, on the Coromandel Coast, and perhaps in Central India; cultivated throughout India.

The seeds yield an oil, of which little is known. The flowers are used in perfumery and embalming, and a fragant otto is distilled from them at Lucknow, Benares, &c. Specimens and further information should be obtained from the North-West Provinces.

LEPIDIUM.

183 **Lepidium sativum,** *Linn.,* CRUCIFERÆ.

THE GARDEN CRESS.

Vern.—*Aleverie, haleem,* BENG.; *Assalia,* BOM.; *Adala-vitala,* TEL.; *Haleem,* DEC.; *Ahreo,* SIND.

Cultivated throughout India and Western Tibet, not known in an indigenous state; has been known in a state of cultivation in Europe for over 300 years.

It yields an oil somewhat similar to mustard oil. It is very little known, but is referred to by **Hawkes** in his *Report on the Oils of South India.* It may be possible to procure a specimen of the oil from Madras.

LEUCAS.

184 **Leucas cephalotes,** *Spreng.,* LABIATÆ.

Vern.—*Bura-hul-khusa,* BENG.; *Tumba,* MAR.; *Gurosaturni,* TEL.

The Manipuris prepare an oil from the seeds of this plant, used in dyeing with **Rubia,** which see.

LINUM. 185

Linum strictum, *Linn.*, LINEÆ.

Vern.—*Basant, bab-basant*, PB.

A small, herbaceous plant with yellow flowers, found on the Punjab hills and in Tibet, cultivated in Afghanistan for its oil and oil-cake.

The oil does not differ essentially from the ordinary linseed oil. Specimens of the plant, seed, oil and oil-cake might be procured from the Punjab.

L. usitatissimum, *Linn.* 186

LINSEED; FLAX.

Vern.—*Tisi, maseni,* or *masina*, BENG.; *Alsi*, HIND.; *Alási, javusa*, BOM.; *Alish*, KASHMIR; *Alshi-virai*, TAM.; *Alasi*, TEL.

Linseed is extensively cultivated in Bengal and the North-West Provinces for its oil and cake, rarely for its flax.

"The oil is a clear, yellowish-brown fluid, not congealed even by the most intense frost, smoking very much when burned, readily becomes rancid, dries speedily, becoming by age of a deep colour, very acrid, and nearly opaque; odour peculiar and disagreeable." (*Cooke.*)

This is the most important oil-seed of India; there are three or four well-known forms, with white, red or brown seeds; the white-seeded form is regarded as the best, since it yields about 2 per cent. more oil and of a better quality than that obtained from the coloured forms. The coloured seeds are, moreover, frequently adulterated with rape seed, and any admixture of fatty oil-yielding seeds lessens the drying power, thus destroying or impairing one of the most valuable characteristics of Linseed Oil.

There are two processes of extraction, *viz.*, cold and hot expression. The cold-drawn oil is pale-coloured, has less odour and taste than the hot, the seed yielding 20 per cent. of oil. The hot process is more profitable, about 27 per cent. of an inferior quality of oil being obtained.

To extract the oil, the seed is first bruised, ground and made into an oily paste. This is thereafter subjected to a high pressure. If the hot process is resorted to the cake is brought under the influence of a steam-heat of 200° F. This heat coagulates the albumen and liquifies the fatty matter, thereby giving the higher percentage of oil.

The seed should be stored for three or four months before extracting the oil. This is done to improve the quality and increase the quantity of the oil. The oil-cake obtained after expression of the oil is an important article of food for cattle, and the ground seed is largely used for poultices.

Formerly the English supply of Linseed was almost entirely from Russia. It was early discovered, however, that, as with many of the other substances required to meet the demands of English works and factories, India could supply a large proportion of the Linseed required. **Lieutenant Hawkes**, in his *Report on the Oil-seeds of South India*, states, that in the year 1852-53, Madras imported Linseed Oil to the extent of 4,552 gallons, valued at Rs. 8,763, whilst in the same year it exported 1,045 cwts. of Linseed to England. In the *Statement of Trade and Navigation from British India for 1877-78*, Madras is shown as exporting only 900 cwts., and in 1881-82 there were apparently no exports at all of this seed from Madras. **Simmonds**, in his *Tropical Agriculture*, states, that in 1875, England imported from India 92,290 cwts. of Linseed. While Madras seems to have ceased to export it, Bengal and Bombay have progressed enormously, for in 1877-78 the exports to Great Britain had increased to

4,990,736, the total exports from India during the year being 7,198,918. There seems to be some mistake regarding the enormous exports from India in 1875 and the imports into England as given by **Simmonds** for that year; but, nevertheless, it is evident that in this respect, as with almost every other existing raw product, the contact of England with India has resulted in an enormous development of the resources of India and a consequent enhancement of wealth.

The following tables show the exports from India from 1873 to 1882, and an analysis of those for the years 1877-78 and for 1881-83 shows the presidencies from which it was exported and the countries to which it was consigned:—

Exportation of Linseed for ten years ending 1882-83.

Years.	Quantity.	Value.
	Cwts.	R
1873-74	2,820,315	1,41,01,571
1874-75	3,595,798	1,79,79,287
1875-76	6,282,512	3,31,71,635
1876-77	5,614,617	3,01,54,374
1877-78	7,198,918	4,22,44,293
1878-79	3,503,795	2,18,92,113
1879-80	3,105,058	2,03,06,023
1880-81	5,997,172	3,69,81,265
1881-82	5,146,110	3,00,91,066
1882-83	...	...

Analysis of exports of Linseed from India for the year 1877-78.

Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	Cwts.	R		Cwts.	R
Bengal . .	5,199,353	2,97,73,810	United Kingdom .	4,990,736	2,86,38,291
			France . . .	1,155,960	72,04,594
			United States . .	567,696	34,14,019
			Holland . . .	232,412	14,01,988
Bombay .	1,999,385	1,24,69,583	Belgium . . .	127,526	8,33,449
			Italy . . .	44,103	2,86,170
			Egypt . . .	30,030	1,22,850
			South America .	27,068	1,83,074
Madras .	180	900	West Indies . .	17,500	1,22,500
			Australia . .	4,281	27,729
			Other countries .	1,606	9,629
TOTAL .	7,198,918	4,22,44,293	TOTAL .	7,198,918	4,22,44,293

Analysis of exportation of Linseed from India from the year 1881-82.

Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	Cwts.	R		Cwts.	R
Bengal . .	2,864,116	1,60,43,413	United Kingdom .	3,177,096	1,80,13,392
			France . . .	293,464	16,78,616
			United States .	991,532	62,00,465
			Belgium . .	239,253	14,60,108
Bombay . .	2,281,422	1,40,42,598	Holland . .	216,612	13,51,646
			Italy . . .	94,044	6,05,821
			Egypt . . .	85,955	4,89,989
			Spain—Gibraltar .	38,866	2,33,196
Sind . .	572	5,055	Germany . .	4,686	29,596
			Australia . .	4,530	27,790
			Other countries .	72	447
TOTAL .	5,146,110	3,00,91,066	TOTAL .	5,146,110	3,00,91,066

The analysis of the exports for the year 1881-82 shows that the trade in Linseed is on the increase in Western India, the exports from Bombay having nearly doubled those of the previous five years, while Bengal seems to be falling off considerably.

The oil is extensively used in the manufacture of paint, printing ink, floor-cloth, artificial India rubber, oil varnish, and soft soap. The seed is nearly always adulterated, pure Linseed Oil being almost unknown. In Russia it is adulterated with hemp seed, and in India, being grown as a mixed crop with rape, it is never pure. In medicine Linseed Oil is used in the cure of burns. The refined cold-drawn oil is sometimes administered internally.

LITSÆA.

Litsæa consimilis, *Nees.*, LAURINEÆ. 187

Vern.—*Chirira, chir-chira,* KUMAUN; *Pooteli,* NEPAL.

A small, evergreen tree, with thin, grey bark, met with on the Himalaya, from Simla eastward.

An oil is extracted from the fruit, and used for burning. (*Gamble.*)

L. Sp.? 188

Vern.—*Chirndi,* CHENAB; *Chindi, chilotu, rauli, shalanghi,* RAVI; *Charka,* BIAS.

A small tree met with in parts of the Punjab Himalaya, at 2,500 to 6,800 feet, up to the Chenab.

In some places in Chumba, an oil, expressed from the fruit, is burned; and according to **Madden,** a species of **Litsæa,** which may be this same plant, yields a coarse oil, in Kumaun.

L. zeylanica, *Nees.* 189

Syn.—L. FOLIOSA, *Nees.*

Vern.—*Chimdi, shalanglu, rauli, chilotu, charkha,* PB.; *Kanwal, litbora, sara, chir-chira,* HIND.

A moderate-sized evergreen tree, in the North-West Himalaya, between 2,000 and 8,000 feet; East Bengal, Burma, and South India.

An oil is extracted from the fruit, which is used for burning. (*Gamble.*)

LUFFA.

190 **Luffa acutangula,** *Roxb.*, CUCURBITACEÆ.

Vern.—*Torooi, jinga, turi,* HIND.; *Jhingá, jinga,* BENG.; *Peekun-kai,* TAM.; *Burkai, bira-kaya,* TEL.; *Peechenggah,* MAL.; *Turái, sirolá,* BOM.; *Turi,* SIND.

Met with in the North West Himalaya to Sikkim, Assam, East Bengal and Ceylon. Cultivated in most parts of India.

From the seed an oil is prepared.

191 **L. ægyptiaca,** *Mill, ex Hook f.*

Syn.—L. PENTANDRA, *Roxb.*

Vern.—*Dún-dúl,* BENG.; *Nuni-beerd,* TEL.; *Ghosáli, parosí,* BOM.

Met with in Rungpore, &c., and cultivated in most parts of India.

It yields an oil, the qualities of which are not known.

192 **L. Sp.**

Mr. Baden-Powell mentions an oil under this name.

Further information required, and a specimen of the plant, so as to allow of scientific identification.

MACASSAR.

Macassar Oil. *See* **Carthamus tinctorius,** *Linn.*

Is used by the natives of Singapore as a hair oil.

193 **Malabar Oil.**

"The ambiguous term 'Malabar Oil' is applied to a mixture of the oils obtained from the livers of several kinds of fish frequenting the Malabar Coast of India and the neighbourhood of Kurrachee. The species chiefly caught are *Rhyncobatus pectinata, R. lævis, Galiocerda-tigrina* and *Curcharias melanopterus.*" (*Spons' Encyclop.*)

MALLOTUS.

194 **Mallotus philippinensis,** *Müll. Arg.*, EUPHORBIACEÆ.

Syn.—ROTTLERA TINCTORIA, *Roxb.*

Vern.—*Kamela, kamal, kúmila,* HIND, PB.; *Rohní,* OUDH; *Púnag, túng, kishur, kamalguri,* BENG.; *Kampilla, rechanaka,* SANS.; *Rúen, riúna, roli,* KUMAUN; *Rauni, rori,* C. P.; *Sinduria,* NEPAL; *Puroa,* LEPCHA; *Gangai,* ASS.; *Chinderpang, machugan,* GARO; *Kapila,* BOM; *Kapli, kapila,* TAM.; *Kúmkuma, vassuntagunva, chendra, sinduri,* TEL.; *Kurku corungamaje,* KAN.; *Shendri,* MAR.; *Tawthidin,* BURM.

A small tree of the Sub-Himalayan tract, from the Indus eastward to Bengal, 5,000 feet in altitude; Central and South India, Burma and the Andaman Islands; very common in Manipur.

It yields a clear, limpid oil, of a pale brownish or sherry colour. Used medicinally as a cathartic, and has valuable properties attributed to it. (*Cooke.*)

I can find no other reference to this oil. The red powder is largely used by the natives, entering into every prescription for worms. The oil referred to is probably gingelly oil medicated with this powder. Information and specimens would be most acceptable. **Dr. Cooke** says that a specimen of the oil was sent to London from Coorg.

Manaloo Oil of Kanara is said to be used for lamps. 195

Information regarding this oil, and the plant from which it is derived, and also specimens, would be most acceptable.

MANGIFERA.

Mangifera indica, *Linn.*, ANACARDIACEÆ. 196

Vern.—*Am,* HIND.; *Ghariam,* ASS.; *Amru,* SANS.; *Amb,* BENG.; *Amba,* MAR.; *Máa, mangas,* TAM.; *Mamadi, mamid,* TEL.; *Thayet,* BURM.

A large, evergreen tree, wild on the Western Ghâts; cultivated all over India.

Dr. Cooke says that the seeds contain a large percentage of oil.

Mangosteen Oil. *See* **Garcinia indica.**

MATRICARIA.

Matricaria Chamomila, *Linn.*, COMPOSITÆ. 197

THE CHAMOMILE.

Syn.—ANTHEMIS NOBILIS.

Vern.—*Babun-phul,* BENG., HIND.; *Cha-maindu-pu,* TAM.

A native of Europe and Persia, imported into India from the latter country.

An essential oil is obtained by distillation, which possesses antispasmodic properties to a great extent.

MELALEUCA.

Melaleuca Leucadendron, *Linn.*, MYRTACEÆ. 198

THE WHITE WOOD TREE; CAJPUT OIL TREE.

Vern.—*Kayu-puti.*

An evergreen tree, met with in Tenasserim.

"The leaves give the Cajput Oil of commerce, which is largely exported from the Malay Archipelago, and is used in medicine as a stimulant and diaphoretic." (*Gamble.*) This volatile oil is a mobile, transparent fluid, of a fine, pale bluish-green colour. It has a strong, agreeable odour and an aromatic taste. It is useful in flatulent colic and painful spasmodic affections of the bowels, and is regarded as useful in cholera. It is also used externally as an embrocation in rheumatism and other painful affections.

"The plant grown in the island of Bouro is said to yield the best oil. The leaves are culled and distilled with water. The oil obtained generally contains copper but not to a poisonous extent. Annually about 8,000 bottles of the oil are exported from Bouro to Singapore, and re-exported to Calcutta and Bombay." (*Spons' Encyclop.*)

MELIA.

Melia Azedarach, *Linn.* 199

THE PERSIAN LILAC, BASTARD CEDAR or BEAD TREE.

Vern.—*Bakayan, betain, drek, bakain,* HIND.; *Ghora nim,* BENG.; *Gori nim,* BOM.; *Chein, kachein,* SUTLEJ; *Maha-limbo, malla, nim,* C. P.; *Bakainú,* NEPAL; *Mallai vembu, malai-veppam,* TAM.; *Taruka vepu, makanim,* TEL.; *Tamaka,* BURM.; *Mahanimba,* SANS.

A tree, with smooth, grey bark, commonly cultivated throughout

India, and believed to be indigenous in the outer Himalaya, Siwalik tract, and the hills of Beluchistan.

The seeds are largely used in India for rosaries. From the fruit a fixed oil is extracted, which, according to **Dr. Birdwood**, is similar to that of *Ním* or *Margosa*.

200 **Melia Azadirachta,** *Linn.*, MELIACEÆ.

THE NIM TREE; THE MARGOSA TREE.

Syn.—AZADIRACHTA INDICA, *Brandis.*

Vern.—*Nim*, BENG., HID.; *Nimba*, SANS.; *Veppam-vimbu*, TAM.; *Yapa, yepa*, TEL.; *Thimbawtamaka*, BURM.

A large tree, planted and self-sown throughout the greater part of India and Burma. It is also indigenous to India, although in the plains chiefly met with in a state of cultivation.

"From the fruit is extracted, by boiling or pressure, a fixed, acrid, bitter oil (Margosa), deep yellow, with a strong, disagreeable flavour. It is used medicinally as an antiseptic and anthelmintic." (*Brandis.*)

"**Dr. Maxwell** has found this oil as efficacious as cod-liver oil in cases of consumption and scrofula." (*Balfour.*) **Sir W. O'Shaughnessy** says: "The oil is thought anthelmintic, and is applied externally to foul ulcers, and used as a liniment in rheumatic and spasmodic affections, and in head-aches from exposure to the sun."

Dr. Dymock says, the oil "is applied to suppurating, scrofulous glands, is given in leprosy and a variety of diseases." During the winter months in India the oil solidifies, becoming fluid in summer. It is sometimes burned in lamps, but emits a heavy and disagreeable smoke. Its antiseptic property would seem to show that, if made into soap, it would be found very serviceable for the purpose of washing sores, especially when healing up. It makes a good, useful, hard soap. Should a trade in this oil arise with Europe, an unlimited supply might be obtained from the vicinity of our larger towns, and within easy access to the railways.

MENTHA.

201 **Mentha piperita,** *Sm*, LABIATÆ.

PEPPERMINT.

A herbaceous plant of the temperate regions, largely cultivated for culinary purposes, most gardens having a few plants. It is also cultivated extensively on account of its volatile oil. The cuttings are first sun-dried, a process which increases the yield about 7 per cent.; thereafter they are distilled. The oil is colourless or faint greenish-yellow, has a peculiar odour of its own, and a pleasant, cooling flavour. It is largely used in confectionery, perfumery, and medicine.

202 **M. sativa,** *Linn.*

This plant, like the preceding, is grown for culinary purposes and for its oil. Both are frequent in the gardens of Europeans in India; they grow freely and easily in Behar and the North-West Provinces, but do no flower in the plains of India.

203 **M. viridis,** *Linn.*

This plant is common in the plains in a state of cultivation, and is known in Bengal as *Púndia.*

MESUA.

Mesua ferrea, *Linn.*, GUTTIFERÆ. 204

Vern.—*Nagesar,* HIND. and BENG.; *Nágach ampá,* BOM.; *Nangal,* TAM.; *Nágakésara,* TEL.; *Gangan,* BURM.; *Nahor,* ASS.; *Belutta-champagam,* MAL.

A middle sized tree, met with in the hills of Eastern Bengal, the Eastern and Western Peninsulas, and the Andaman Islands.

In Ceylon an oil is obtained from the seeds, thick and of a dark colour. It is used both for burning in lamps and as an external application to sores. It is also largely expressed by the inhabitants of North Kanara for use as an embrocation in rheumatism.

MICHELLA.

Michelia Champaca, *Linn.*, MAGNOLIACEÆ. 205

Vern.—*Champa,* HIND.; *Champa, champaka,* BENG.; *Pivalá chápká,* BOM.; *Titsappa,* ASS.; *Shimbu, sempangam,* TAM.; *Tsaga,* BURM.

A large, handsome tree, with yellow sweetly-scented flowers; cultivated throughout India, wild in Bengal, Nepal and Assam.

The seeds are said to yield a fatty oil and the flowers a volatile oil, but this is doubtful. The leaves are known to yield a sweetly-scented water on distillation. This otto somewhat resembles *Ilang* (**Canunga odorata**) for which it is used as an adulterant.

Information and specimens of the oils of this plant are much required.

MIMUSOPS.

Mimusops Elengi, *Linn.*, SAPOTACEE. 206

Vern.—*Bukal, bohl,* BENG., MAR.; *Mulsári, maulser,* HIND.; *Bakuli, ovali,* BOM.; *Magadam,* TAM.; *Pogada,* TEL.; *Bokal, boklu,* KAN.; *Elengi,* MAL.; *Vavoli,* MAR.; *Kaya,* BURM.

A large, evergreen tree, wild on the Western Ghâts as far north as Khandalla, Northern Circars, Burma, Andaman Islands and Ceylon; cultivated throughout India. (*Gamble.*)

The Pagoda Gum of Madras is said to be obtained from this tree.

The seeds yield an oil which may be used medicinally, and also in painting.

M. indica, *A. DC.* 207

Syn.—M. HEXANDRA, *Roxb.*

Vern.—*Khir, khirni,* HIND.; *Rain,* MEYWAR; *Palla, kannu-palle,* TAM.; *Palle panlo, palla pandu,* TEL.; *Khirni,* MAR.; *Raini,* GONDI; *Palú,* CINGH.

A large, evergreen tree on the mountains of South India, extending in Central India to the sandstone hills of Pachmari, north of the Godavari. It is found only on sandstone, and frequently associated with **Buchanania Angustifolia** and **Hardwickia binata.** (*Gamble.*)

It is reported to yield an oil from its seed.

M. Kauki, *Linn.* 208

Vern—? *Adoma,* GOA.

A large tree of Burma (Amherst) and the Malayan Peninsula to Australia.

The seed is said to yield an oil in Burma.

Mooroogaua. *See* **Tallow.**

MORINGA.

209 **Moringa aptera,** *Gaertn.*, MORINGACEÆ.

A native of Africa; long naturalised in the West Indies.

It yields the *Ben Oil* of watch-makers. While the next species yields the oil as freely if not more freely than **M. aptera,** it is in India rarely ever used for this purpose.

210 **M. pterygosperma,** *Gaertn.*

HORSE RADISH TREE.

Vern.—*Sujna,* BENG.; *Soanjna, sanjna,* HIND.; *Shegava,* MAR.; *Morunga,* TAM.; *Danthalon,* BURM.

A small, handsome tree, much distorted in the plains of India through the habit of coppicing to produce the young twigs which are eaten.

The seeds yield a clear, limpid, almost colourless oil, rather thick. It is used for medicinal purposes. The oil, however, is seldom made, and it does not form an article of export. This fact is the more remarkable when it is remembered how extensively the tree is cultivated. It is to be hoped that attention may be attracted to this subject, for India might easily enough, and with profit, supply the whole world with its Ben or Moringa Oil which consists especially of oleine, margarine and stearine. It has a specific gravity of 0·912 at 60° F., it is fluid at 77° F., and solid below 60° F. After separation of the solidifiable portion, it forms on cooling the clear oil so much used by watch-makers. It is also much prized by perfumers as an absorbent for some of the more delicate odours.

Muduga Oil. *See* **Butea Frondosa.**

MURRAYA.

211 **Murraya Kœnigii,** *Spr.*, RUTACEÆ.

Syn.—BERGERA KŒNIGII, *Linn.*

Vern.—*Gandla, gandi, bowla,* PB.; *Harri, katnim,* HIND.; *Barsanga* BENG.; [*Kárhi-nimb,* MAR.; *Chanangi,* HYDERABAD; *Karepak, karivepa.* TEL.; *Kamwepila,* TAM.

A small tree of the outer Himalaya, ascending to altitude 5,000 feet from the Ravi to Assam, Bengal, South India and Burma. Largely cultivated in the plains on account of its leaves which are used to flavour curries.

The seeds yield a yellow, clear, transparent oil, known as Simbolee or Limbolee oil. **Birdwood** says that this oil is obtained from the leaves, not from the seeds. It is probable that there are two oils—one, a fatty oil from the seeds, and the other, an essential oil from the leaves. **Cooke** says the oil is from the seeds, but as he quotes **Birdwood** as his authority, this may be a mistake. It seems also probable that **Murraya exotica,** *Linn.*, a much more frequent plant in our gardens and known as *Kamini,* is the plant most frequently used. To enable this confusion to be cleared up, information and specimens are required.

212 **Mustard.**

Three species of **Brassica** yield Mustard and Mustard Oil, but are grown more especially for the well-known condiment which is prepared from the seed. These are **Brassica nigra, B. alba** and **B. juncea,** which see

MYRISTICA.

Myristica malabarica, *Lamk.*, MYRISTICEÆ. 213

Vern.—*Kanagi, pindi-kai* (seeds), KAN.; *Ránajáyaphala* (seeds), *káyaphala* (mace), *Rámapatri,* BOM.

A small, evergreen tree of South Kanara and Malabar.

The seed, when bruised and subjected to boiling, yields a quantity of yellowish concrete oil. This oil, when melted down with a little bland oil, is applied efficaciously to ulcers.

M. moschata, *Willd.* 214

THE NUTMEG; MACE.

Syn.—M. OFFICINALIS, *Linn. f.*

Vern.—*Jatiphala,* SANS; *Jaephal, juephal,* HIND., BOM., *Jaia-phula,* BENG.; *Jaipatri,* BOM., *Jadicai,* TAM.; *Jajikaia,* TEL.; *Sadikka, jatipullum,* CINGH.; *Jaipal* (Nutmeg), *jati, jauntari* (Mace), HIND.

The tree is cultivated in many parts of India, Ceylon and the Malay Archipelago; largely so in the Moluccas, Banda, the Straits, and Zanzibar.

The nut yields an essential and a fixed oil. The former is white, acrid, pungent, and smelling powerfully of nutmeg; the latter is yellowish in colour, and solid. This latter substance is the Nutmeg Butter. It is extracted from refuse nuts by reducing them to powder, heating them in a water bath, and, while hot, obtaining the oil by expression. Upon cooling this solidifies into the mottled, orange-brown butter. It has a pleasant odour, and a fatty, aromatic flavour.

Both the Mace and the Nutmeg yield an otto or essential oil upon aqueous distillation. That from the former is yellow, with a strong odour of the mace and an aromatic flavour. Nutmeg essential oil is nearly colourless, or white, with a strong odour and flavour of the nut. Both the essential oils are extensively used for flavouring soaps. The extent to which this is the case is at once seen by the enormous consumption of Nutmegs in Great Britain. The actual consumption is variously stated. **Piesse** (*Art of Perfumery*) states that the "produce of Nutmegs in the Moluccas has been reckoned at from 600,000 to 700,000 lbs. per annum, of which half goes to Europe, and about one-fourth that quantity of Mace. The annual consumption of Nutmegs in Britain is said to be 140,000 lbs." **Simmonds**, on the other hand, gives the imports into Britain from 1840 to 1870, and during the five years ending 1870 the average was 592,736 lbs., valued at £37,756.

The Nutmeg was successfully introduced into the Straits, and some 30 years ago, before the fatal blight which ruined the trade, the exports from Singapore exceeded those from Banda. The Chinese have of late been making hopeful efforts to introduce the plant and to compete with the Spice Islands. It has also been established in India on the Nilgiri Hills, but the future field for Nutmeg plantations seems to be Jamaica.

The Otto of Nutmegs enters largely into the composition of English perfumery, but especially so that of Frangipani. When used sparingly it combines pleasantly with lavender, santal, and bergamot. Formerly soap, known as Banda Soap, was prepared from the fatty oil or Butter of Nutmegs. The trade in this article has died out, being replaced by ordinary soap perfumed with the otto of the Nutmeg. Medicinally, Nutmegs are chiefly used as condiments, and in moderate doses they assist digestion, dispel flatulence and strengthen the viscera. This action is chiefly due to the presence of the essential oil of Mace and Nutmeg. Nutmeg is also largely used as a condiment in cookery and confectionery.

The Dutch connection with the Nutmeg trade is anything but creditable to their system of administration or their commercial instincts. On taking possession of the Spice Islands they endeavoured to exterminate the tree from all the islands except the northern portions of Banda, but a hurricane which swept over that portion of their settlements nearly exterminated the plant, while it left the other islands untouched. On another occasion, finding the market glutted, they destroyed by fire enormous quantities so as to save the market from falling. In spite of this the Nutmeg trade has prospered, but largely through migrating from its original home, and there seems good reason to expect that India will soon be able to meet her home demand. In 1877 there was exported to Europe 1,207 lbs. of Nutmegs of Indian produce.

MYRTUS.

215 **Myrtus communis,** *Linn.*, MYRTACEÆ.

THE MYRTLE.

Vern.—*Vilayati mehndi, burg morad, hab-ul-ás,* PB. *Bab-ul-aas* (berry), BOM.

Occasionally met with in cultivation in India.

A medicinal oil is said to be obtained from the berries of this plant. **Baden-Powell** remarks that it is reputed to strengthen and promote the growth of the hair. This must apparently be a fatty oil. Information and specimens of this oil are much required, and might be procured from the Punjab.

An essential oil is distilled from the leaves in Europe, and used in perfumery; apparently this oil is not prepared in India. The leaves, flowers and fruit are all distilled together, the resulting oil being yellowish or greenish-yellow, about 5 oz. being obtained from 1 cwt of the leaves. This oil is of great fragrance and is much prized. It is, however, expensive, has been successfully imitated by cheaper preparations.

NARDOSTACHYS.

216 **Nardostachys Jatamansi,** *DC.*, VALERIANACEÆ.

THE SPIKENARD.

Vern.—*Jatamansi,* BENG.; *Bálchiar,* HIND.; *Massi,* GARHWAL; *Bálachara, sumbal,* BOM.

A small, herbaceous plant of the Alpine Himalaya, altitude 11,000 to 15,000 feet, from Kumaun to Sikkim

Baden-Powell mentions this plant as yielding an oil, but information with regard to it is very much required. The *Jatamansi* root enters largely into the composition of native perfumery, and chiefly in combination with valerian, forming a mixture anything but a favourite with Europeans. Formerly, however, this was much valued by the ladies of Rome. Modern taste in the matter of perfumes, as with many other luxuries, has gone in favour of delicacy or quality instead of strength and quantity. There cannot be a doubt, however, as to the importance of this perfume in India, and it is much to be regretted that neither the mode of preparation, nor the combinations of this perfume, can at present be ascertained from the literature of Indian economic science. It seems to be chiefly used to perfume the hair, as was the case with the spikenard of the ancients.

Neeradimootoo Oil. 217

Vern.—*Jungli badam-ka-tel,* HIND.; *Mootoo, yennai,* TAM.

This oil was sent to the Madras Exhibition under several names. It is generally prescribed by native practitioners as a valuable medicine.

Definite information from Madras as to the source of this oil, as also specimens, would be most acceptable.

NERIUM.

Nerium odorum, *Soland.,* APOCYNACEÆ. 218

THE SWEETLY-SCENTED OLEANDER.

Vern.—*Kaner, kaniyúr,* HIND., N. W. P.; *Karabi,* BENG.; *Kanhera,* BOM.; *Kanira, ganhira, gandere* (in the plains); *Kaner,* PB.; *Alári,* TAM.; *Gànneru,* TEL.; *Kharsahra,* PERS.; *Karavira, asvamáraka,* SANS.

An erect bush of the Western Himalaya from Nepal westward ascending to 6,500 feet in altitude. Distributed to Central India, Afghanistan and Japan. Universally cultivated in gardens on account of its sweetly-scented flowers, of which there are single and double, white and pink, forms. It is probable that this plant does not differ from the Oleander of the Mediterranean regions (**N. Oleander**).

An essential oil may be distilled from the flowers, and the natives use, in the treatment of eczema, impetigo and other skin diseases, gingelly oil medicated with a decoction of the root of this plant. The whole plant is very poisonous to cattle, as may be seen by the Sanskrit and Persian names, and it is probably used criminally for the destruction of cattle. **Dr. Stewart** states that in Kangra the bark and root are frequently used by suicides.

NICOTIANA.

Nicotiana Tabacum, *Linn.,* SOLANACEÆ. 219

TOBACCO.

Vern.—*Tumak, tumbaca, bujjerbhang,* HIND.; *Se, tumbaca,* BENG.; *Poghei,* TAM.; *Poghako,* TEL.; *Doonkola,* CINGH.; *Se,* BURM.

Tobacco was most probably introduced into India about the year 1605 and is now cultivated all over the country and extensively used. It apparently shows no tendency to grow wild, while **N. plumbaginifolia,** *Viv.,* has apparently gone quite wild and is not met with in cultivation in India.

The seed yields a clear, limpid, colourless oil, used in painting.

Dr. Cooke says that the specimens of Tobacco-seed Oil seen by him in London were obtained from Sattara and Mysore. Specimens of this oil are required, and it would be interesting to learn further particulars, especially as to whether a trade exists in this oil.

NIGELLA.

Nigella sativa, *Linn.,* RANUNCULACEÆ. 220

BLACK CUMIN SEED.

Vern.—*Kálejira, kálongi,* BOM., HIND.; *Mugrela,* BENG.; *Carin-siragum,* TAM.; *Nulla-gilakara,* TEL.

Extensively cultivated.

"The seeds of this plant yield a dark-coloured fragrant oil" (*Hawkes*), "clear, nearly colourless, and about the consistence of Castor Oil" (*Cooke*). This difference of opinion, it is hoped, may suggest the advisability of an investigation into the subject. The seed is said to yield about 10 per cent. (?) of an essential oil. **Birdwood** says: "the seeds yield an oil but little used."

NYCTANTHES.

221 **Nyctanthes Arbor-tristis,** *Linn.*, OLEACEÆ.

Vern.—*Harsihár, harvinghar, saherwa, seoli, nibari,* HIND.; *Shinghár, harshingár, sepháliká,* BENG.; *Pakara, saduri, kuri,* PB.; *Manjapa,* TAM.; *Seitbibu,* BURM.

A small tree of Central India, extending to Bengal and Burma, cultivated throughout India, universally met with in the flower gardens of the natives of Bengal.

The flowers of this plant contain an essential oil. Specimens and particulars of preparation and economic use required.

OCIMUM.

222 **Ocimum adescendens,** *Willd.*

Vern.—*Bun-túlsi,* BENG.

A small, prostrate plant, quite scentless, very hairy, with ovate, oblong, obtuse leaves; flowers small, pale pink.

223 **O. basilicum,** *Linn.*, LABIATÆ.

THE COMMON BASIL.

Vern.—*Babui tulsi,* BENG., HIND.; *Salsat,* DEC.; *Tirunitrup-pattiri,* TAM.; *Vibudi-patri,* TEL.

A small, herbaceous shrub, found in almost all parts of India, Java, &c.

Spon's Encyclop. mentions it in the list of vegetable fixed oils.

It is believed that the natives of the various parts of India, in their perfumery, distil ottos of the different species of *tulsi*; but as no information is available in the literature of the subject, it has been thought advisable, as a basis upon which information might be communicated, to classify these plants, giving the vernacular names for the species as recognised by Botanists.

224 **Var.** *1st.*—**pilosum,** *Benth.*

Vern.—*Baboi-tulsi,* BENG., HIND.; *Tukhmirihán,* BOM.; *Varvara,* SANS. The seeds are called *rehán, faranj-mushk,* HIND.

A small, much-branched, herbaceous bush, extensively cultivated in the plains of India. *Leaves,* small, thin, oblong, entire; *petioles et verticiles,* very hairy; *racemes,* elongated; *corolla,* often glabrous.

225 **Var.** *2nd.*—**anisatum,** *Benth.*

THE SWEET BASIL.

Syn.—O. BASILICUM, *Linn., in Roxb. Fl. Ind.*

Vern.—*Sabajhi,* SIND; *Nigand bábri,* PB.

The same vernacular names are used for this plant as for the preceding.

A more erect and less-branched form, with thick, glabrous *leaves,* subdentate; *corolla,* often villose.

Roxburgh says this form was introduced from Persia, having been first sent to the Botanic Gardens under its Persian name *Deban Shah,* or *Deban Macwassi.* It is nearly allied to the next form.

Var. *3rd.*—**glabratum,** *Benth.* 226

Syn.—O. INTEGERRIMUM, *Willd*; O. CARYOPHYLLATUM, *Roxb.*

Vern.—*Gúlal-túlsí*, BENG., HIND.

Stem, erect; *petioles* and *calyces*, sparely ciliate; *leaves*, scarcely toothed; *racemes*, elongated, simple. Frequent about the houses and temples of the Hindus; the whole plant, very aromatic and fragrant.

Var. *4th.*—**thrysiflorum,** *Benth.* 227

Vern.—

An erect, glabrous, herbaceous bush. *Petioles* and *calyces*, scarcely ciliate; *racemes*, thyrsoide (*i.e.*, branched, with the middle portions longer than the lateral divisions); *Flowers*, small, pale pink.

Ocimum gratissimum, *Linn.* 228

Vern.—*Ram-tulsí*, BENG., HIND.; *Ramatulasa*, BOM.; *Banjere*, PB.

A larger plant than the preceding, grown in gardens; *stems*, glabrous; *leaves*, petioled; ovate, acute, crenate, or grossly dentate; *bracts*, lanceolate; *base*, hastate, *raceme*, simple or slightly-branched at the base; *flowers*, white or pale yellow, scarcely larger than the calyx; *stamens* exserted. Roxburgh remarks of this plant that it diffuses a stronger fragrance than any of the other members of the genus.

O. sanctum, *Linn.* 229

There are two forms of this plant, which will be recognisable as met with in cultivation, owing chiefly to the difference in colour of leaf, and scarcely deserve to be regarded as varieties.

Var. *1st.*—**sanctum proper.** 230

Vern.—*Kala* or *Krishna túlsí*, HIND., BENG., & TEL.; *Tulasa*, BOM.; *Babúrí*, PB.

A small herb, profusely branched; the *branches*, clothed with dark, purple hairs; *leaves*, about 1½ inches long and 1 inch broad, dark-coloured; *bracts*, cordate.

Var. *2nd.*—**villosum,** *Roxb.*, **Sp.** 231

Vern.—*Túlsí* or *túlasí*, HIND. & BENG.

A small herb, clothed with white or pale green hairs; *leaves*, ovate, oblong, crenate, serrate, obtuse; from 1 to 2 inches long; *bracts*, reniform.

OLEA.

Olea europœa, *Linn.*, OLEACEÆ. 232

THE OLIVE.

This valuable plant has been introduced on the Himalaya and the Nilgiris.

In Europe there are several cultivated varieties, each possessing certain peculiarities of its own. All agree in one respect, namely, they must be cultivated on an open rich soil, with free drainage, yet with a plentiful supply of moisture. They can endure neither the freezing northern climate, nor the burning tropical sun. The crop is collected as the drupe reaches maturity; delay injures the quality and lessens the quantity of the oil. The fruit is ripe when by gentle pressure oil exudes. The yield has been variously stated from 30 to 50 per cent., being governed by the form of plant cultivated, climate, soil, time and system of expression. The oil is extracted by two distinct processes or stages, *viz.*, crushing and pressing. The crushing should not be delayed. The oil from the pericarp may be first separated by gentle pressure, then that from the remainder of the fruit, two classes of oils being thus obtained in the crushing stage, or both may be expressed together. After removal of the oil by crushing, the pulp is placed in bags and resubmitted to pressure in a warm steam press.

The best qualities of oil are those obtained by the cold crushing before the application of water or heat.

The Olive is extensively cultivated in the south of France. The Portuguese oil is very inferior to the French, owing to carelessness in preparation. Spain has nearly 3 millions of acres under this crop. Italy has about 2½ millions of acres of olives. The Spanish oil, in point of quality, cannot compare with the French or the Italian.

Superior Olive Oil is somewhat viscid, of a pale greenish-yellow colour, with a faint, agreeable odour, and has a bland, oleaginous flavour. The best qualities are chiefly consumed as food and medicine, constituting the Salad Oil of commerce. The commoner kinds are consumed in soap manufacture, as lubricants, and for illuminating purposes.

Information regarding experiments to introduce this tree on the Himalaya are much required, and any information regarding the preparation of Indian Olive Oil.

233 **O. ferruginea,** *Royle.*

Syn.—O. CUSPIDATA, *Wall.*

Vern.—*Kau,* HIND.; *Khwan, shwan,* TRANS-INDUS; *Zaitún,* AFG.; *Ko, kohú, káo, kau,* PB.; *Khau,* SIND.

A moderate-sized, deciduous tree of Sind, Sulaiman Range, Salt Range, and North West Himalaya, extending as far as the Jumna eastward, and ascending to 6,000 feet. (*Gamble.*)

In Afghanistan an oil is extracted from the indigenous tree. This oil would doubtless take an important place in the oil trade were it procurable in large quantities, for it is of as good quality as the ordinary Olive Oil. If attention were to be given to the cultivation of this indigenous plant, there seems every reason to expect that India would soon find a place amongst the countries which supply the Olive Oil of commerce.

[218] **Oleander.** *See* **Nerium odorum,** *Soland,* APOCYNACEÆ.

Mr. Baden-Powell mentions this among his medicinal oils. Further information is required.

[80] **Orange flower or Neroli,** *See* **Citrus.**

[170] **Orris Oil.** *See* **Iris.**

PANDANUS.

234 **Pandanus odoratissimus,** *Willd.,* PANDANEÆ.

Vern.—*Keura,* HIND.; *Kea, ketuki, keori,* BENG.; *Mugalik,* TEL.; *Thalay, talum,* TAM.; *Satthapu,* BURM.

A common shrub, frequently planted on account of its fragran- flowers, but wild on the coasts of South India, Burma, and- the Andat mans.

Attar of Keora is obtained from the flowers. (*Baden-Powell.*)

PAPAVER.

Papaver somniferum, *Linn.*, PAPAVERACEÆ. 235

THE POPPY; OPIUM.

Vern.—*Post, apim,* BENG., HIND.; *Khash-khash-ka-post,* DEC.; *Gasa-gasa-tol,* TAM.; *Gasa-Gasa-tolu,* TEL.

Extensively cultivated in North and Central India.

The seeds are expressed to obtain an oil which is used for culinary purposes and as a demulcent medicine. It is also used in lamps, and much esteemed by Europeans, owing to its property of becoming colourless when exposed to the sun.

PARMELIA.

Parmelia kamtschadalis, *Esch.*, LICHENES., 236

Vern.—*Chalchalira, charcharila, aúsneh, pat-tharke-phúl, chalpúri, charchubila.*

A lichen, found in the bazars of the Punjab and of the North-West Provinces, obtained from the Himalaya, and used largely in calico printing, both in order to perfume the fabric and as a pale pink dye. Doubtless several species are used for these purposes **Ainslie** says there are many in use in South India.

Medicinally they are used in native practice as mild tonics and antiperiodics. By hakims used in dyspepsia, vomiting, pain in the liver or womb, &c. (*Baden-Powell, Atkinson, &c.*)

P. perlata, *Ach.*, and **P. perforata,** *Ach.* 237

Syn.—LICHEN ROTUNDATUS, *Rottler in Ainslie's Mat. Med. II, p. 170.*

Vern.—*Khirásus-sakhar, behqul-hajar,* ARAB.; *Gulesang,* PERS.; *Kulpasi,* TAM.; *Patthar-ka-phul,* HIND. and DEC.; *Ratipanché,* TEL.; *Patthar-ká-pkul,* DEC.; *Kalap-pách-chi, kalap-pú,* TAM.; *Dhondéchaphúla,* MAR.; *Kiyár-peon,* BURM.

Ainslie says that this plant has long been used by the Vytians of South India medicinally, and that they attribute to it a peculiar cooling quality and prepare with it a liniment for the head. The Indian Pharmacopæia mentions several instances where a poultice of this plant has been found efficacious as a diuretic placed over the renal and lumbar regions. It further suggests, however, that its virtue may be shewn in this respect to be little more than that of any ordinary warm poultice.

Stewart mentions a **Parmelia** (undetermined), common on rocks at various places in Chumba (North-West Himalaya), altitude 11,000 to 15,000 feet, which is there used as an external application to burns. Specimens of this plant, as also further information, would be interesting.

Peacock-grease. 238

Spons' Encyclop. says that this substance is esteemed in the East Indies.

Specimens and further information should be obtained from the North-West Provinces.

PEGANUM.

Peganum Harmala, *Linn.*, RUTACEÆ. 239

Vern.—*Spelane, karmal.* The seed is known as *Isband Lahori.*

A bush 1 to 3 feet in height, much branched and densely clothed with leaves; met with in Kashmir, the Punjab, and the North.

Baden-Powell in his *Punjab Products* mentions this among his oils and oil-seeds.

[279] **Penæa Sarcocolla,** *See* **Sarcocolla.**

PERILLA.

240 **Perilla ocimoides,** *Linn.*, LABIATÆ.

Vern.—*Bhanjiri.*

A native of Nepal, common on the Ghâts, and in Ava, Sylhet and Kumaun. The whole plant has a strong, rather disagreeable smell. Cultivated on the Himalayas, 4,000 to 5,000 feet.

Yields an aromatic oil used along with the food of the hillmen. (*J. F. Duthie.*)

PERSEA.

241 **Persea gratissima,** *Gaertn.*, LAURACEÆ.

THE AVOCADO PEAR.

This fruit tree is cultivated in India.

An oil is obtained from the pulp of the fruit, of a dark greenish-brown colour, used for burning and soap-making, &c.

PETROLEUM.

242 **Petroleum.**

The term is applied to a class of liquids occurring in various geological formations and geographical localities. It possesses a limpid and oily consistence, a strong bituminous odour and a dark yellowish-brown colour. Its specific gravity ranges from 0·8 to 1·1. It is composed of hydrocarbons of various descriptions.

There is much difference of opinion among geologists as to the origin and formation of Petroleum. The general belief is that it is formed by the slow decomposition of organic remains, animal or vegetable, or both combined. Others account for it by the action of sea water and the condensation of carbon vapours.

It is obtained in Burma, from shallow tertiary and post-tertiary clays and lignites.

PEUCEDANUM.

243 **Peucedanum graveolens,** *Benth.*, UMBELLIFERÆ.

Vern.—*Sulpha,* BENG.

Throughout tropical and sub-tropical India; often cultivated.

The crushed fruit, submitted to aqueous distillation, yields 3 to 4 per cent. of essential oil, composed of two or more hydrocarbons. The oil is skimmed from the distillate, and the latter forms the commercial Dill-water. The oil may be used in mixtures for perfuming soap.

PIMPINELLA.

244 **Pimpinella Anisum,** *Linn.*, UMBELLIFERÆ.

THE ANISE SEED.

Vern.—*Belati-radhúní.*

Ervados, BOM., a corruption of Portuguese *Herbadoce*. Imported into Bombay from Persia under the name of *Rásianeh.*

Sometimes met with in cultivation in gardens during the cold season; introduced from Europe.

An essential oil is obtained to the extent of 3 per cent. from the fruit of this plant by distillation. It is of a yellowish colour, having the odour and flavour of the fruit. It is applied medicinally to both men and animals, and is largely used in the preparation of cordials. It is also used for scenting soaps and pomatums.

PINUS.

Pinus Gerardiana, *Wall.*, CONIFERÆ. 245

Vern.—*Chilghosa, jalghosa,* AFG.; *Chiri, pritu, mirri, galgoja,* CHENAB; *Kashti,* RAVI.

A moderate-sized tree with very thin, grey bark; found in the inner dry and arid North West Himalaya, and also in isolated areas of no great extent, generally between 6,000 and 10,000 feet, on the mountains of North Afghanistan and Kafiristan.

Gamble says that the seed is oily, with a slight turpentine flavour.

P. longifolia, *Roxb.* 246

Vern.—*Nakhtar,* AFG.; *Chil, chir, dráb chir,* PB.; *Anander,* JHELUM; *Dhúp,* OUDH; *Dhúp, sala dhúp,* NEPAL.

A large tree of Afghanistan, outer North West Himalaya, ascending to 7,500 feet; Sikkim, and Bhutan, ascending to 4,000 feet, though scarce above 3,000 feet.

M. Baden-Powell in his *Punjab Products* mentions this among his oils and oil-seeds.

PIPER.

Piper Cubeba, *Linn. f.*, PIPERACEÆ. 247

CUBEB PEPPER.

Syn.——CUBEBA OFFICINALIS, *Miq.*

Vern.—*Kabab-chini,* BENG., HIND.; *Kákola,* MAR.; *Val-milaku,* TAM.; *Taka-miriyalu,* TEL.; *Kabab-Chini,* GUZ.; *Simvankarawa,* BURM.

Cubebs are imported from Java, but cultivated to a small extent in India.

An essential oil is obtained from them by distillation with water. It is thick and colourless, with a faint, aromatic odour, and a warm flavour of camphor and peppermint.

P. nigrum, *Linn.* 248

BLACK PEPPER.

Vern.—*Kala-marich,* BENG., HIND.; *Choka,* DEC.; *Milagu,* TAM.; *Miriyalu,* TEL.

A climber, extensively cultivated in South India.

Mentioned by **Baden-Powell** as yielding oil.

PISTACIA.

Pistacia Lentiscus, *Linn.*, ANACARDIACEÆ. 249

Vern.—*Tantaric,* PB.

A shrub of the Mediterranean region.

Baden-Powell mentions this oil.

250 **Pistacia vera,** *Linn.*

THE PISTACHIO NUT.

Vern.—*Pista,* BENG., HIND.

The Pistachio Nuts (*pista*) are imported into India from Afghanistan. An oil is extracted from the kernels of the fruit, which is used medicinally as a demulcent and restorative. It is greenish-coloured, sweet-flavoured, and aromatic. It is used in food, but soon becomes rancid, and is then used only for burning purposes.

PITHECOLOBIUM.

251 **Pithecolobium dulce,** *Bth.*, LEGUMINOSÆ.

Syn—INGA DULCIS.

Vern.—*Dakhani babúl,* HIND.; *Karkapilly,* TAM.; *Kwaytanyeng,* BURM.

A tree introduced from Mexico, and commonly cultivated in India and Burma.

Yields a light-coloured oil as thick as castor oil.

POGOSTEMON.

252 **Pogostemon Patchouly,** *Pellet.*, LABIATÆ.

PATCHOULI.

Vern.—*Pachapat,* BENG.; *Máli,* MAR.

It is found in East Bengal, Burma, and the Malay Peninsula.

An essential oil is obtained from the plant, which is used as a perfume. The yield of oil is about ½ oz. from 1 lb. of leaves.

POLYANTHES.

253 **Polyanthes tuberosa,** *Linn.*, LILIACEÆ.

Vern.—*Gul shab bo,* PB.; *Rajani-gandha,* BENG.

Very commonly cultivated for its flower.

Attar of Tuberose is obtained from the flowers of this plant.

POLYGONUM.

254 **Polygonum bistorta,** *Linn.*, POLYGONACEÆ.

Vern.—*Maslún, mamech, dori, bajir, bélanri, anjabár,* PB.

Common at places in the Punjab Himalaya, from 3,500 to 12,000 feet.

Baden-Powell mentions this oil.

PONGAMIA.

255 **Pongamia glabra,** *Vent.*, LEGUMINOSÆ.

Syn.—GALEDUPA INDICA, *Lam.*

Vern.—*Karanj, papar,* HIND.; *Dalkaramcha, karanja,* BENG.; *Karanj,* BOM.; *Koranju,* URIYA; *Ponga,* TAM.; *Kanga, pungu, ganuga,* TEL.; *Garanji,* GOND; *Thinwin,* BURM.

A moderate sized tree, almost evergreen, native of the Sub-Himalayan tract from the Ravi eastward, ascending to 2,000 feet; Bengal, Burma, Central and South India. An exceedingly common plant in cultivation in Bengal; often grown in hedges.

The seeds of this plant yield a red-brown, thick oil, used for burning, and medicinally as an efficacious application for skin diseases. On cooling it has a tendency to deposit stearine. It is generally known as Karang or Púndi oil. Dr. Gibson regards it as one of the best remedies for cutaneous diseases and rheumatism known. Should a European trade arise, as seems likely, this oil might be prepared to an unlimited extent in Bengal.

PRINSEPIA.

Prinsepia utilis, *Royle*, ROSACEÆ. 256

Vern.—*Bhekal, bekkra, karanga,* HIND.; *Gurinda,* HAZARA.; *Tatua, phulwara, jinti,* CHENAB; *Bekling,* KANAWAR.

A deciduous, thorny shrub, with thin, brown bark on the outer Himalaya, from Hazara to Bhutan, between 2,000 and 9,000 feet, Khásia hills.

An oil is obtained from the seeds, which is used for food and for burning.

PRUNUS.

Prunus amygdalus, *Baillon.*, ROSACEÆ. 257

THE ALMOND.

Syn.—AMYGDALUS COMMUNIS, *Willd.*

Vern—*Badám.*

It is cultivated in Afghanistan, Persia, Kashmir and the Punjab.

It yields two distinct oils—an essential oil and a fixed or fatty oil. The latter oil is obtained by expression from either bitter or sweet Almonds. The average produce is from 48 to 52 lbs. from 1 cwt. of Almonds. The yield is greater by hot expression, 2 lbs. 2 oz. being obtained from 5¼ lbs. of Almonds. The oil is clear, yellow, with an agreeable flavour, but without odour. It is much used by perfumers, but is frequently largely adulterated with gingelly oil, poppy oil or mustard oil.

P. armeniaca, *Linn.* 258

THE APRICOT.

Vern.—*Hári, gardalu, shiran,* PB.; *Iser,* KASHMIR; *Chúari, sardalu, khoobani,* HIND.; *Mishmish,* PERS.

A moderate sized, deciduous tree, cultivated in the North-West Himalaya.

A clear oil, of a pale yellow colour, which smells strongly of hydrocyanic acid, and which, indeed, contains about 4 per cent. of it, is extracted from the seed. This oil is used in burning and cooking, and for the hair.

P. communis, *Huds., forma* ALUCHA. 259

THE PLUM.

Vern.—*Alucha, olchi, sardalu,* PB.

Cultivated from Garhwal to Kashmir in the Western Himalaya.

The plant yields the Plum Oil of Europe, used for illuminating purposes. It does not keep even in Europe, becoming rancid in summer.

260 **Prunus persica**, *Bth.* and *Hook. f.*

THE PEACH.

Syn.—AMAGDYLUS PERSICA, *Willd.*

Vern.—*Ghwareshtái*, AFG.; *Shúft alú*, PERS.; *Aru, aor, chinannu*, PB.; *Aru*, HIND.; *Takpo*, LEPCHA.

It is commonly cultivated everywhere throughout the Himalaya and in Upper Burma.

The oil obtained from the kernels resembles almond oil, for which it may be substituted. It is used in cookery and for lamps by the hill tribes of the North-West Himalaya and Kashmir. It is sometimes also used as a hair oil.

PSORALEA.

261 **Psoralea corylifolia,** *Linn.*, LEGUMINOSÆ.

Vern.—*Hakuch*, BENG.; *Bavauchi*, DEC.; *Karpuva-arishi*, TAM.; *Karu bogi-vittulu*, TEL.

A common, herbaceous weed, found in Bengal and South India.

PTEROCARPUS.

262 **Pterocarpus Marsupium,** *Roxb.*, LEGUMINOSÆ.

Vern.—*Bija, bijásar, bijásal*, HIND.; *Byasa*, URIYA *A, sana*, MAR.; *Peddagi, yeggi, pedega*, TEL.; *Vengai*, TAM.

A large, deciduous tree of Central and South India, extending northward to the Banda District of the North-West Provinces.

It is an oil-yielding plant.

PUTRANJIVA.

263 **Putranjiva Roxburghii,** *Wall.*, EUPHORBIACEÆ.

Syn.—NAGEIA PUTRANJIVA, *Roxb.*

Vern.—*Putajan*, PB.; *Jia puta, joti-juti, putra-jiva*, HIND.; *Karu-pale*, TAM.; *Kadrajuvi*, TEL.; *Toukyat*, BURM.

A moderate-sized, evergreen tree, with pendant branches; found in the Sub-Himalayan tract from the Chenab eastward; Oudh, Bengal, Burma and South India.

The seeds yield an oil of an olive-brown colour, rather turbid, soon exhibiting a deposit of the more solid portion. It is used for burning.

RAPHANUS.

264 **Raphanus sativus,** *Linn.*, CRUCIFERÆ.

THE RADISH.

Vern.—*Mula*, BENG.; *Muli*, HIND.; *Monla*, BURM.

Extensively cultivated in the plains of India.

The seeds yield an oil apparently similar to the oils obtained from other cruciferous plants.

265 **Ray-oils.**

These are very extensively procured from the livers of **Raja clavata, R. pastinæa,** and other species of fish indigenous to the Indian seas.

RHUS.

Rhus semialata, *Murray*, ANACARDIACEÆ. 266

Syn.—R. BUCKIAMELA, *Roxb.*; R. JAVANICA, *Linn.*

Vern.—*Tatri, titri, chechar, arkhar, arkol, kakri, dúdla, wánsh, hulashing,* PB.; *Rashtu,* SUTLEJ; *Dakhmila, daswila,* N. W. P.; *Bakkiamela, bhagmili,* NEPAL; *Tukhril,* LEPCHA.

A small tree, with bark ¼ inch in thickness, rough, with deep furrows. It is met with in the outer Himalaya from the Indus to Assam and the Khásia Hills, ascending to 1,000 feet in altitude.

The fruit is eaten by the hill tribes, and from it is prepared a wax called *dinlu* in Nepal. (*Gamble.*)

Further information and specimens of this wax much required.

R. succedanea, *Linn.* 267

Syn.—R. ACUMINATA, *DC.*

Vern.—*Tatri, arkol, titar, lakhar,* PB.; *Raniwalai,* NEPAL; *Serhnyok,* LEPCHA; *Dingkain,* KHÁSIA. The galls are called *Kákadásingí* in Bombay.

A small, deciduous tree, with thin bark, met with on the Himalaya from the Jhelum to Assam, Khásia Hills; altitude from 2,000 to 8,000, feet.

The seeds yield a fine, yellowish-white wax, known in commerce as "Japan Wax." The tree is planted in Japan along roads, and regularly worked for this wax, which is of a snow-white colour and is made into candles. (*Gamble.*) The wax is analogous to bees-wax. It is obtained by pressing the bunches of small fruits.

Samples and information regarding Indian trade in this substance are much required.

R. Wallichii, *Hook. f.* 268

Syn.—R. VERNICIFERA, *DC.*

Vern.—*Kambal, gadúmbal, arkhar, arkol, harkú,* PB.; *Akoria, kaunki, bhaliun,* N. W. P.; *Bhálaio,* NEPAL.

A small or moderate-sized tree on the North-West Himalaya, from 2,000 to 7,000 feet.

The seeds yield wax similar to the "Japan Wax." **Brandis** states that candles are made in Japan of the wax expressed from the fruit.

RICINUS.

Ricinus communis, *Linn.*, EUPHORBIACEÆ. 269

THE CASTOR OIL PLANT or PALMA-CHRISTI. HUILE DE CASTOR, RICIN DE PALMA-CHRISTI, *Fr.*, RICINUS SAMENÖL, *Germ.*

Vern.—*Rand, arand, arendi, índ,* HIND.; *Reri, bherunda,* BENG.; *Eranda,* SANS.; *Erendí, erunkukrí,* SIND.; *Aneru,* CHENAB; *Harnauli,* SALT RANGE; *Orer,* NEPAL; *Sittamunuk,* TAM.; *Amadum, amdi, sittamindi,* TEL.; *Kyetsu,* BURM.

A large shrub or small tree, indigenous in Arabia and North Africa; cultivated throughout India, and often found wild. (*Gamble.*) Most authors regard it as also indigenous to India. It exists chiefly in a state of cultivation.

RICINUS.

There are some 15 or 20 known varieties of this plant, of which 5 or 6 are common in Bengal. These may be reduced to three sections :—

(*a*) Small-seeded forms }
(*b*) Large do. } These also vary in the colour of the seeds.
(*c*) Form grown on account of its leaves as a food for the Eria silk-worm.

The small-seeded form is that most frequently cultivated as an oil-crop, being sown broad-cast with other crops. It is a small, distorted plant as compared with the large-seeded form chiefly grown as a hedge, and often attaining the height of 20 feet.

The Castor Oil Plant is now extensively cultivated in most parts of the world. In cold climates it becomes an annual, and some of the beautiful, dark-red foliaged forms are grown as ornamental foliage plants. It has been known from remote ages. It was called *Aporave* by the Greeks, *Ricinus* by the Romans,, *Kikajon* by the Hebrews, and Pliny speaks of it as *Kiki*. It is known to the Jews of the present day by the name *Kiki*, and is one of the five sacred oils which they are allowed to burn on the Sabbath.

It is cultivated pretty generally throughout India, to the greatest extent in Oudh, and least of all in the Punjab. It requires little cultivation, but prefers an open sandy to a clay soil. It is sown as a field-crop broad-cast; two sowings a year, one in November and the other in May. Although it yields nearly as good a crop the second or even the third year, the natives uproot the crop every year, making fresh sowings. As a hedge it is supposed to protect the fields from insects. That it does exercise an influence over the atmosphere seems conclusively proved from the repeated reports of travellers and soldiers being attacked with diarrhœa from encamping near a castor oil field, or on a field recently cleared of the crop. The operation of collecting the nuts is tedious, and the small and large forms are kept quite distinct, the former yielding a larger quantity and better quality of oil than the latter.

Preparation of the oil from the small-seeded form.

When fresh the seed is sifted to free it of dirt or impurities. It is then partially crushed, and freed of the husk or other coloured portions. It is then squeezed into "bricks" of a uniform shape and enclosed in clean gunny bags. The bricks are thereafter placed in an ordinary press, and the oil expressed. To a gallon of oil thus obtained one pint of water is added, and the mixture boiled in iron pans until the water evaporates. The mucilage encrusts the basin, and the albumen coagulates, but at this stage the pan must be removed from the fire, for if the temperature is allowed to rise above the boiling point of water, it undergoes a degeneration, becoming dark-coloured and possessed of an empyreumatic odour and flavour. It is filtered, the pure oil being stored in tins. This is known as *cold-drawn castor oil*, and is of a light straw to greenish colour. About 50 per cent. of oil is obtained by this process, and may be manufactured at about 4*d*. per lb.

The oil from the smaller seeds is also sometimes separated by a process of boiling. The seed is first boiled for two hours, then sun-dried, thereafter reduced to a powder and reboiled until the oil rises to the surface. Oil prepared in this way is free from unpleasant odour, and is largely used in native medical practice as a purgative; in European practice, the cold-drawn form is that regarded as fit for human use.

Preparation of oil from the large-seeded form.

This oil is sometimes prepared by the cold process, but more frequently by the hot, with the addition, that the nuts are often roasted, so as

RICINUS.

to coagulate the albumen within the seeds, and liquify the oil. After roasting they are pounded and boiled until the oil separates. The yield is a little over 30 per cent. of an oil very inferior to that obtained from the small-seeded form. This oil is dark-coloured, almost red, has an offensive odour, thick and viscid. It is chiefly used for home consumption in ordinary country lamps and for dressing leather.

It is a remarkable fact that most of the Castor Oil exported from India is prepared in Calcutta. Madras, which is stated to have 67,000 acres under this crop, sends its seed to Calcutta to be made into oil.

Castor Oil is used to a certain extent by the dyers of India to fix and make more brilliant many of their famous colours. It is largely used by the Africans for culinary purposes and by the Negroes in the West Indies. **Bellew** states that it is also used for this purpose near Ghuzni. Its chief use is, however, as a valuable purgative, the cold-drawn form being that used in Europe. A large trade also exists in the commoner forms, which are extensively used in the preparation of leather, principally morocco leather. As a lubricant it is also largely used in Europe, and as a lamp oil in India.

The following are the exports of Castor Oil from India:—

Exportation of Castor Oil.

TOTAL FOR THE FIVE YEARS ENDING 1882.		
Year.	Quantity.	Value.
	Gallons.	Rs.
1877-78	1,411,216	1,926,427
1878-79	2,119,757	3,153,969
1879-80	2,651,889	3,210,703
1880-81	2,890,803	3,104,701
1881-82	3,009,288	2,977,122

Analysis of the exportation of Castor Oil for 1881-82.

Presidency from which exported.	Quantity	Value.	Country to which exported.	Quantity.	Value.
	Gallons.	Rs.		Gallons.	Rs.
Bengal	2,627,923	26,20,683	United Kingdom	1,902,877	18,74,615
Madras	205,274	1,75,811	Australia	542,995	5,08,997
Bombay	174,590	1,78,473	Straits	148,776	1,64,917
British Burma	1,501	2,155	Mauritius	111,457	1,11,720
			China—Hong-Kong	96,822	1,05,019
TOTAL	3,009,288	29,77,122	Ceylon	78,693	76,690
			United States	44,713	43,776
			Natal	25,318	26,327
			Russia	15,742	16,388
			Italy	15,020	19,145
			France	8,541	10,389
			Other countries	18,334	19,139
			TOTAL	3,009,288	29,77,122

ROSA.

The following are the exports of Castor Oil seed :—

Exportations of Castor Oil seed.

TOTAL FOR THE FIVE YEARS ENDING 1882.		
Year.	Quantity.	Value.
	Cwt.	Rs.
1877-78	4,521	27,412
1878-79	74,214	5,00,056
1879-80	237,601	11,80,768
1880-81	76,461	4,33,858
1881-82	250,696	11,77,090

Analysis of the exportation of Castor Oil seed for 1881-82.

Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	Cwt.	Rs.		Cwt.	Rs.
Madras	172,536	7,61,210	France	150,574	6,80,513
Bombay	77,224	4,11,627	Italy	65,116	3,50,776
Bengal	936	4,253	United States	34,387	1,40,904
			Belgium	290	1,440
TOTAL	250,696	11,77,090	Russia	210	2,940
			Other countries	119	517
			TOTAL	250,696	11,77,090

ROSA.

270 **Rosa alba,** *Linn.*, ROSACEÆ.

Syn.—R. GLANDULIFERA, *Roxb.*

Vern.—*Goláb,* HIND., BENG. ; *Gúl,* BOM. ; *Goláb, sewti,* PB.

The Rose-oil or Otto of Roses is distilled from the flowers of several varieties of roses. In India large areas of land have been converted into rose-gardens, at Patna, Ghazipore, Lahore, Amritsar and other places. The Otto is prepared in the following way :—The flowers are distilled with double their weight of water in clay stills; the rose-water is then placed in a shallow vessel covered with muslin and kept exposed all night to the cool air. In the morning the oily portion, which has gathered on the top, is gently taken off by means of a feather and put into a phial. This process is repeated night after night until the whole of the oily substance is thus extracted. The colour of the Otto varies from green to bright amber and reddish.

The greatest possible confusion exists as to the species of rose which are used for the preparation of the attar or in native medicine. Dried twigs with leaves accompanying the economic products would be most acceptable, so as to allow of their being scientifically identified.

SALIX.

Salix capensis, *Thunb.*, SALICINIÆ. 271

Syn.—S. ÆGYPTIACA, *Thunb.*

Mr. Baden-Powell, in his *Punjab Products,* mentions this plant among his medicinal oils.

SALVADORA.

Salvadora oleoides, *Linn.*, SALVADORACEÆ. 272

Vern.—*Kabbar, jhár, diár,* SIND.; *Jál, ván, váni, mithivan,* PB.; *Jhal,* HIND.; *Ughai, koku,* TAM.; *Pilu, khakhan,* MAR.

A large, evergreen shrub or tree of the arid zones, Sind and the Punjab, forming the greater part of the vegetation of the desert; ascends often to 3,000 feet in the Trans-Indus hills and to 2,400 feet in the Salt Range.

The seeds yield a solid fat of a dull sulphury yellow colour.

S. persica, *Linn.* 273

THE TOOTH-BRUSH TREE.

Syn.—S. WIGHTIANA, *Beddome.*

Vern.—*Arák, irak,* ARAB.; *Kabbar, kharidjar, pilu,* SIND.; *Jhál,* RAJ.; *Kauri-ván, Kauri-jal, jhar,* PB.; *Rhakhan,* MAR.; *Opú, ughai,* TAM.; *Waragu-wenki,* TEL.; *Pilú, khakhan,* MAR.

A small, evergreen tree, with thin grey bark, wild in Sind, Rajputana, Guzerat, Konkan, and the Circars.

The oil of this plant may be similar in character to that of the preceding.

SAMADERA.

Samadera indica, *Gaertn.*, SIMARUBEÆ. 274

Vern.—*Samadara,* CINGH.; *Kathé,* BURM.

A small tree of South India and Ceylon.

The seeds of this plant yield an oil which is used medicinally in rheumatism.

Sandal wood. *See* **Santalum album,** *Linn.*, SANTALACEÆ. [275]

SANTALUM.

Santalum album, *Linn.*, SANTALACEÆ. 275

THE TRUE SANDAL-WOOD.

Vern.—*Chandan, chandal, sandal,* HIND.; *Chandan,* BENG.; *Shandana-kattai,* TAM.; *Gandhapu-chekk,* TEL.; *Sandaku,* BURM.

"A small, evergreen tree of the dry region of South India. It grows naturally in the drier parts of Mysore, Coimbatore, and Salem districts, extending south to Madura and north to Kolhapur; generally at an elevation of from 2,000 to 3,000 feet, in poor soils, and seeking the protection of hedgerows and scrub jungles." (*Gamble.*)

The seeds of the Sandalwood tree yield by expression a thick and viscid oil, which is burnt by the poorer classes in lamps. Sandalwood essential oil is distilled from the wood. The roots yield the largest quantity and finest quality. The white or sap wood is rejected for distillation. The process is continued for 8 or 10 days, more water being added. The yield is about 2½ per cent.

The oil is transparent, of a yellow colour, and is one of the most favoured of Indian perfumes, especially among Mahomedan gentlemen. It is largely prepared in Mysore from which further information, specimens of oil, of the chips as used, and of the still used by the natives, should be obtained.

SAPINDUS.

276 **Sapindus Mukorossi,** *Gaertn,* SAPINDACEÆ.

THE SOAP-NUT OF NORTH INDIA.

Syn.—S. DETERGENS, *Roxb.*

Vern.—*Ritha, dodan, kanmar,* HIND.; *Phenila,* SANS.

A handsome, deciduous tree, with grey bark, cultivated throughout North West India and Bengal, Kumaun, Sylhet and Assam.

The fruit is very largely used for, and exported as, a substitute for soap.

It is chiefly used for washing silk and woollen cloth, being regarded as superior to soap by native manufacturers. This and the next species are used indiscriminately, and both yield oil.

277 **S. trifoliatus,** *Linn.*

THE SOAP-NUT TREE OF SOUTH INDIA.

Syn.—S. EMARGINATA, *Vahl.*

Vern.—*Ritha,* HIND.; *Bara-ritha,* BENG.; *Mukta maya,* URIYA; *Konkúdú,* TEL.; *Pounanga, ponán-kottai, puvandi,* TAM.; *Thalay marathu, antawála, puvella,* CINGH.

A large tree of Bengal, South India and Ceylon, often cultivated.

A semi-solid oil is extracted from the kernels of this plant. It is too costly to be in general use.

278 **Sarcocolla, sp?** LEGUMINOSÆ.

Mr. Baden-Powell mentions this among his medicinal oils. Specimens of the plant and oil are required from the Punjab.

SARCOSTIGMA.

279 **Sarcostigma Kleinii,** *W. & A*, OLACINEÆ.

Vern.—*Poovana, poovenagah, adul, odul.*

Found in the Eastern and Western Peninsulas; Malacca (*Maingay*), Cochin and Travancore (*Wight*), and the Koncan (*Stocks*).

This plant yields a medicinal oil, much used on the western coast for rheumatism. It is also burnt in lamps. It has a peculiar but not disagreeable flavour.

280 **Sardine Oil.**

Several species of Sardine afford an abundance of oil.

[47] **Sarson Oil.** *See* **Brassica campestris.**

SCHLEICHERA.

Schleichera trijuga, *Willd.*, SAPINDACEÆ. 281

Vern.—*Kosum, gausam,* HIND.; *Kúsimb,* BOM.; *Rusam,* URIYA; *Pává, pú, púlachi, solim-buriki,* TAM.; *Pusku, may, roatanga,* TEL.; *Gyo,* BURM.; *Cong, conghas,* CINGH.

A large, deciduous tree of the Sub-Himalayan tract, from the Sutlej eastward, Central and South India and Burma.

The seeds yield an oil which is used as lamp oil in Malabar. **Dr. S. Arjan** says that this oil is used for the cure of itch and acne (*see Dymock's Mat. Med.*). **Roxburgh** states that the bark of this tree, rubbed up with the oil, is used to cure itch.

SEMECARPUS.

Semecarpus Anacardium, *Linn. f.*, ANACARDIACEÆ. 282

THE MARKING-NUT TREE.

Vern.—*Bhilawa, bheyla,* HIND.; *Bhalai,* NEPAL; *Bhela, bhelatuki,* BENG.; *Bhallia,* URIYA; *Kongki,* LEPCHA; *Shayrang,* TAM.; *Jiri, jidi,* TEL.; *Che,* BURM.

A deciduous tree of the Sub-Himalayan tract, from the Sutlej eastward, ascending to 3,500 feet, forests of India, extending to Chittagong, but not to Burma.

The seeds yield a very dark tenacious oil. **Brandis** says that this oil, mixed with the milk of **Euphorbia**, is made into bird-lime by the wild tribes of the Satpura Range. It is also used as a preventive against the attacks of white ants, and by native practitioners in rheumatic and leprous affections.

SESAMUM.

Sesamum indicum, *Linn.*, PEDALINEÆ. 283

GINGELLY OR SESAME OIL; BENNÉ-OIL, HUILE DE SÉSAME, *Fr.*; SESAMÖL, *Germ.*

Vern.—*Mithá tél, krishna-tél,* HIND.; *Tél,* BENG.; *Nal lenney, yelloo-cheddie,* TAM.; *Manchi-núne noovooloo,* TEL.; *Bárik-tél* (seeds), DEC.; *Hnan,* BURM.

This plant is commonly cultivated in India, where it is indigenous. It is now cultivated in nearly every tropical country.

There are two easily-recognised varieties; one with white seeds (*safed tél*) and the other with black seeds (*kála tél*). The latter form is much more common, and yields a superior oil. It is sown in March, ripening in May, while the white form is sown in June and ripens in August. The oil is extracted by the same process as that for mustard-oil. Gingelly Oil is clear and limpid, of colour varying from pale yellowish to dark amber, having no smell, and not liable to become rancid. It is composed essentially of oleine, which is often present to the extent of 75 per cent. It is frequently adulterated with ground-nut oil. It is stated that 10 per cent. of Gingelly Oil, mixed with other oils, may be detected by shaking 1 grain of a cold mixture of sulphuric and nitric acids with one grain of the mixed oils, when a fine green colour is the result, a colour which no other oil will produce. In India, Gingelly Oil is used for culinary purposes, in anointing the body, in soap-manufacture, and as a lamp oil. In England, it is chiefly used in making soap and for burning in lamps. It resembles olive-oil in many of its properties, and is used similarly. The oil obtained from the black variety is suited for medicinal purposes. It is used as a demulcent in dysentery and urinary diseases in combination with other medicines. It is also extensively used in the manufacture of Indian perfumery, and native medicinal oils are prepared by boiling it with certain drugs.

The cultivation of this plant, as a supply of the European trade, might be extended very considerably. In the *Trade and Navigation* Statistics there is no mention made of exportation of Gingelly (*Jinjili*) Oil until 1880-81 when 118,750 gallons, valued at Rs. 1,36,770, and in 1881-82, 111,701 gallons valued at Rs. 1,20,182, were exported, chiefly to Arabia, none apparently going from India to Europe. Of the exports from India in 1881-82, 105,344 gallons were from the Bombay Presidency, and only 1,370 gallons from Bengal; of the exports for that year 79,381 gallons of the oil went to Arabia. Gingelly seed has been regularly exported to Europe, and from 1877—82 the average has been over 1½ millions of cwts., the great bulk of this amount going to France. The following table shews the exports from India during the year 1881-82, and the countries to which exported. The smallness of the exports from Bengal and of the imports into the United Kingdom is remarkable:—

Presidency from which exported.	Quantity.	Value.	Country to which exported.	Quantity.	Value.
	Cwt.	R		Cwt.	R
Bombay .	994,120	64,84,475	France . . .	1,493,429	93,77,526
Madras .	521,946	31,32,962	Italy . . .	311,587	20,47,299
Bengal .	295,099	17,24,372	Belgium . .	72,389	5,00,001
Sindh . .	106,651	8,35,273	United Kingdom .	16,669	1,08,169
British Burma	38	225	Ceylon . . .	12,884	74,644
			Spain—Gibraltar .	3,000	19,500
			Holland . .	1,449	9,060
			Other Countries .	6,447	14,108
TOTAL .	1,917,854	1,21,77,307	TOTAL .	1,917,854	1,21,77,307

SHOREA.

284 **Shorea robusta,** *Gaertn.*, DIPTEROCARPEÆ.

Vern.—*Sál, sála, salwa, sakhu,* HIND.; *Sakwa,* NEPAL; *Salwa,* URIYA; *Koroh,* OUDH; *Sarei, rinjal,* C. P.; *Gúgal,* TEL.

A large, gregarious tree of the north-east, moist and intermediate zones: Sub-Himalayan tract, from the Bias to Assam, eastern part of Central India, from the Ganges to the Godaveri, extending westward to the longitude of Mandla, with an outlying patch on and around the sandstone hills of the Panchmari Range.

The seeds yield an oil; but further information is wanted.

SMILAX.

285 **Smilax china,** *Linn.*, LILIACEÆ.

Vern.—*Chobohini,* HIND.

Mr. Baden-Powell mentions it among his medicinal oils.

Spermaceti. 286

This is the solid wax-like portion of the sperm-oil or so-called "head-matter" found in the head of the sperm-whale.

SPINACIA.

Spinacia oleracea, *Mill.*, CHENOPODIACEÆ. 287

Vern.—*Paluk, sag-paluk,* HIND.; *Bij-palak,* PB.; *Ispanaj,* ARAB., PERS.; *Vusayley-keeray,* TAM.

This plant is cultivated in some parts of India.

The seeds yield a fatty oil, but this requires to be confirmed.

STERCULIA.

Sterculia fœtida, *Linn*, STERCULIACEÆ. 288

Vern.—*Jangli-badam,* HIND.; *Jangali-badam,* MAR.; *Pinári,* TAM.; *Gurapu-badam,* TEL.; *Shawbyu, letkop,* BURM.

A large, evergreen tree of South India, Burma, Ceylon, Java, &c.

An oil is extracted by boiling the seeds in water.

STRYCHNOS.

Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ. 289

Vern.—*Kuchla, Kajra,* HIND.; *Kuchila,* BENG.; *Kajra,* MAR.; *Yetti,* TAM.; *Mushti, musadi,* TEL.; *Khaboung,* BURM.

A moderate-sized, evergreen tree, with dark grey bark, of Bengal, Burma, and South India.

An empyreumatic oil, prepared from the fresh nut, is used medicinally by native practitioners.

STYRAX.

Styrax benzoin, *Dryand.*, STYRACEÆ. 290

Found in the Malay Archipelago. It yields the true "Gum Benzoin."

"The natives of the Eastern Archipelago distil a volatile oil from Gum Benzoin, by heating it in an earthenware pot, tightly covered, and providing a bamboo for the escape of the oil." (*Spons' Encyclop.*)

SYMPLOCOS.

Symplocos cratægoides, *Ham.*, STYRACEÆ. 291

Vern.—*Lú, landar, laj, losh,* PB.; *Lodh,* KUMAUN; *Loja,* SUTLEJ.

A large shrub or small tree on the Himalaya from the Indus to Assam, between 3,000 and 8,000 feet, Khásia Hills, Hills of Martaban.

Dr. Stewart says that an oil is extracted from the seeds.

TABERNÆMONTANA.

292 **Tabernæmontana dichotoma,** *Roxb.*, APOCYNACEÆ.

Syn.—CERBERA MANGHAS, *Linn.*

Vern.—

A small tree of the Deccan, common in the Western Ghâts and Ceylon. This is the only member of this large Indian genus met with in Ceylon.

An oil is said to be prepared from the seed.

293 **Tallow or Murungana.**

"The cellular tissues of man and quadrupeds contain a concrete fat, the whole mass of tissue and fat being known as 'Suet.' The term 'Tallow' is applied to this fat when it has been liberated from the tissue. Commercially, Tallow is obtained almost solely from the ruminant animals, sheep and neat cattle, and is produced chiefly in the essentially pastoral portions of the globe." (*Spons' Encyclop.*)

This substance, even at high temperatures, remains solid, and in fact it is one of the few fats which possess this property. For Vegetable Tallow *see* **Excæcaria sebifera,** *Müll. Arg.*

TAMARINDUS.

294 **Tamarindus indica,** *Linn.*, LEGUMINOSÆ.

THE TAMARIND.

Vern.—*Amli, ambli, imli,* HIND.; *Tintiri, tintil,* BENG.; *Titri,* NEPAL; *Chincha,* MAR.; *Tintuli,* URIYA; *Púli,* TAM.; *Chinta,* TEL.; *Karangi, kamal, asam,* MYSORE; *Magyi,* BURM.

A large, evergreen tree, cultivated throughout India and Burma as far north as the Jhelum.

The seeds yield a clear, bright, fluid oil, with somewhat of the odour of linseed oil.

[132] **Taramira Oil.** *See* **Eruca sativa.**

TECTONA.

295 **Tectona grandis,** *Linn. f.*, VERBENACEÆ.

THE TEAK TREE.

Vern.—*Sáj,* ARAB.; *Sáj, sal,* PERS.; *Ságun,* HIND.; *Singuru,* URIYA; *Tekku, tek,* TAM.; *Teku,* TEL.; *Kyún,* BURM.; *Jati,* MALAY.

A large, deciduous tree, found in Central and South India and Burma. Cultivated in Assam, Bengal, and the Sub-Himalaya as far north as Saharunpore.

A Teak-seed Oil has been enumerated amongst the products of India, but this may most probably be intended for Teak-wood Oil, which is not a fatty oil. It is of a dull ash colour and opaque. It is chiefly used as a varnish for wood-work either alone or mixed with certain resins.

TERMINALIA.

296 **Terminalia belerica,** *Roxb.*, COMBRETACEÆ.

Vern.—*Babela, beleyleh,* PERS.; *Bahera, bhaira, behara,* HIND.; *Bohera* BENG.; *Behedá,* MAR; *Tani, kattu elupay,* TAM.; *Tani, tandi, toandi* TEL.; *Thitsein,* BURM.

A large, deciduous tree of the Sub-Himalayan tract from near the Indus eastward; forests of India and Burma.

The oil which the seeds yield separates into two portions, the one fluid, of a pale green colour, and the other flocculent, white, semi-solid or as consistent as ghee. It is used medicinally, and chiefly with the object of strengthening the hair.

Terminalia Catappa, *Linn.* 297

THE INDIAN ALMOND.

Vern.—*Badam,* BENG.; *Taru,* KAN.; *Bangali badam,* BOM.; *Natvadom,* TAM.; *Vedam,* TEL.; *Adamarram,* MAL.; *Catappa,* MALAY.

A large, deciduous tree of the coast forests of the Andaman Islands, cultivated in most parts of India and Burma. Introduced most probably from Java.

It yields a limpid oil of a pale sherry colour, resembling almond oil, and since it does not so readily become rancid might, indeed, displace the true almond oil. The greatest expense consists in the separating of the kernel from the nut. As the tree is plentiful everywhere, this oil deserves the attention of Indian dealers, for there seems every chance of a trade arising in it.

T. Chebula, *Retzins.* 298

Vern.—*Harra, har, harara,* HIND.; *Hilikha,* ASS.; *Haritaki,* BENG.; *Silim,* LEPCHA; *Karedha,* URIYA; *Halra,* DEC.; *Hirada,* MAR; *Kadakai,* TAM.; *Karaka, kadukar,* TEL.; *Alale,* MYSORE; *Panga,* BURM.

A large, deciduous tree of the Sub-Himalayan tract, from the Sutlej eastward, ascending to 5,000 feet; Bengal, Assam, Chittagong, Central and South India.

The seeds yield a clear, transparent, almost colourless, fluid oil, used medicinally, and only to be had in small quantities.

TETRANTHERA.

Tetranthera laurifolia, *Jacq.*, LAURINEÆ. 399

Vern.—*Maida, meda, gwa, rian,* PB.; *Garbijaur, singrauf, menda,* HIND.; *Suppatnyok,* LEPCHA; *Kukurchita,* BENG.; *Narra alagi,* TEL.; *Ungdung, ondon,* BURM.

A moderate-sized, evergreen tree of Kumaun, Garhwal, Bengal, Burma, Central and South India.

An oil is obtained in Java from the fruit of this tree.

T. monopetala, *Roxb.* 300

Vern.—*Meda, gwa, singraf, sangran, marda,* HIND.; *Mendah,* GOND; *Ratmanti, kadmero,* NEPAL; *Sualu,* ASS.; *Ungdung, ondon,* BURM.

A moderate-sized, evergreen tree of the Sub-Himalayan tract from the Ravi eastward; Kumaun, Garhwal, Bengal, Burma, Central and South India.

The seeds yield an oil which is used for ointment as well as for candles.

THEOBROMA.

Theobroma Cacao, *Linn.*, STERCULIACEÆ. 301

THE COCOA PLANT.

It has been grown in some parts of India and Ceylon.

The seed or leaves of this plant yield a valuable concrete, fatty oil.

THESPESIA.

302 **Thespesia populnea,** *Corr.*, MALVACEÆ.

THE PORTIA TREE OR TULIP TREE.

Syn.—HIBISCUS POPULNEUS, *Willd.*

Vern.—*Parsipu,* HIND.; *Paresh, parash,* BENG.; *Poris, purasa,* TAM.; *Gangaraya,* TEL.; *Bendi,* GUZ.; *Sureya,* CINCH.

A moderate-sized, evergreen tree of the coast forests of India, Burma, and the Andaman Islands; planted throughout India.

It yields a deep, red-coloured, and somewhat thick oil. The oil may be used medicinally in cutaneous affections.

THEVETIA.

303 **Thevetia neriifolia,** *Linn.*, APOCYNACEÆ.

EXILE OIL.

Syn.—CERBERA THEVETIA. *L.*

Vern.—*Lard kunél,* HIND.; *Payaungban,* BURM.

An introduced bush, become almost naturalised in Bengal, and common everywhere, scarcely a garden in the plains of India being without a few bushes, if not a hedge, of this plant.

It has long, narrow leaves, and is covered all the year through with a profuse show of large, yellow, pendulous, bell-shaped, sweetly-scented flowers. The fruit is curiously flattened like a bivalved shell. From the seed a bright yellow oil has been prepared. **Dr. Warden** informs me that he has separated a highly poisonous principle from the seed, but that the oil is inert and even wholesome.

TRIGONELLA.

304 **Trigonella Fœnum-græcum,** *Linn.*, LEGUMINOSÆ.

Vern.—*Methi,* BENG., HIND.; *Vendayam,* TAM.; *Mentulu,* TEL.

Cultivated in many parts of India, wild in Kashmir and the Punjab.

"In the *Pharmacographia* it is stated that ether extracts from the pulverised seed 6 per cent. of a fœtid fatty oil having a bitter taste." (*Cooke.*)

305 **Tuntapoo Oil (Cassia Tora?)**

An empyreumatic medicinal substance, known about Masulipatam. Information and specimens required.

[47] **Turnip Seeds.** *See* **Brassica campestris,** *var.* **Rapa.**

ULMUS.

306 **Ulmus integrifolia,** *Roxb.*, URTICACÆ.

Vern.—*Papri, khulen, arján, rajáin,* PB.; *Papar, kanju,* KUMAUN; *Papri, dhamna, kúnj, karanji, chilbil,* HIND.; *Aya,* TAM.; *Namli, peddanowli-eragu,* TEL.; *Myaukseit,* BURM.

A large, deciduous tree of the Sub-Himalayan tract from the Bias eastward, Central and South India, Burma.

An oil is expressed from the seed in Melghat. (*Gamble.*)

UVARIA.

Uvaria Narum, *Wall.*, ANONACEÆ. 307

Vern.—*Narum-panel,* MAL.

A large, woody climber of the forests of the Western Peninsula and Central Ceylon.

The roots yield by distillation a sweet-scented, greenish oil, used in various diseases. This oil is said to be prepared in Malabar. The root is fragrant and aromatic, and is also used medicinally.

Specimens of this oil, and further information, required.

VALERIA.

Valeria indica, *Linn.*, DIPTEROCARPEÆ. 308

THE PINEY VARNISH OR INDIAN COPAL TREE.

Syn.—V. MALABARICA, *Blume.*

Vern.—*Pineymaram, dhupmaram,* TAM.; *Dupadu,* TEL.; *Payani,* MAL. *Hal,* CINGH.

A large, evergreen tree with whitish bark, found in the western moist zone, Western Ghâts from Kanara to Travancore, ascending to 4,000 feet.

The seed yields a solid concrete fat, of a whitish or pale yellow colour, adapted to the manufacture of candles and soap. It is also used in lamps.

VERNONIA.

Vernonia anthelmintica, *Willd.*, COMPOSITÆ. 309

Syn.—SERRATULA ANTHELMINTICA, *Roxb.*; CONYZA ANTHELMINTICA, *Linn.*

Vern.—*Buckche, kalieseorie,* HIND.; *Somraj,* BENG.; *Neernoochie, caatsiragum,* TAM.; *Neela-vayalie, adavie-sula-kuru,* TEL.; *Kali-seerie,* DEC.; *Sanni-nayan,* CINGH.

A plant met with in parts of India, especially on the Himalaya.

Lieut. Hawkes states that the seed yields an oil which is never prepared for sale. The oil is probably medicinal.

VIBURNUM.

Viburnum coriaceum, *Bl.*, CAPRIFOLIACEÆ. 310

Vern.—*Kala titmaliya,* KUMAUN; *Bara gorakuri,* NEPAL.

A large shrub, common on the Himalaya from the Punjab to Bhutan, altitude 4,000 to 8,000 feet, Khâsia hills, Nilgiris and Ceylon.

Gamble says that the Nepalese extract from the seed an oil which they use for food and for burning.

VIOLA.

Viola serpens, *Wall,* VIOLACEÆ. 311

Vern.—*Banafsha,* HIND.

A small, procumbent, herbaceous plant, found in the Himalaya, altitude 5,000 to 7,000 feet.

Baden-Powell mentions it as an oil-yielding plant.

VITEX.

312 **Vitex trifolia,** *Linn.*, VERBENACEÆ.

Vern.—*Nishinda,* BENG.; *Sambhalu,* HIND.; *Nirnochi,* TAM.; *Vavilli,* TEL.; *Kyaungban,* BURM.

A small tree or shrub of Bengal, South India and Burma.

Drury says that a clear, sweet oil of a greenish colour is extracted from the root. It is supposed that the seed also yields a fatty oil.

[177] **Walnut.** *See* **Juglans regia.**

WORMIA.

313 **Wormia triquetra,** *Rottb.*, DILLENIACEÆ.

Vern.—*Diyapara,* CINGH.

A tree found in Ceylon up to 2,000 feet.

The nut yields an oil. (*Gamble.*)

WRIGHTIA.

314 **Wrightia tomentosa,** *Röm.* and **W. tinctoria,** *R. Br.*, APOCYNACEÆ.

Vern.—*Vaipallay yennay,* TAM.

Is said to yield a thick, scarlet-coloured, medicinal oil.

There seems to be considerable doubt about this oil, and I am inclined to think that it is entirely prepared from **Holarrhena antidysenterica,** *Wall.* The seeds of **Holarrhena** are linear, oblong, compressed, concave, tipped with a coma of hairs; **Wrightia** has its seeds straight, compressed tip, narrow-necked coma at the base. *See* **Holarrhena.**

XANTHIUM.

315 **Xanthium strumarium,** *Linn.*, COMPOSITÆ.

Syn.—X. INDICUM, *Kon., in Roxb. Fl. Ind. Ed. C. B C. 660*; X. ORIENTALE, *L.*

Vern.—*Bun-okra,* BENG.; *Shankeshvara,* BOM.; *Marlumulta,* TAM.; *Veritel-nep,* TEL.; *Aristha,* SANS.

A weed, met with everywhere throughout the plains of India, and a source of great annoyance to the cultivator. Common in waste places, river-banks and especially so in the vicinity of villages.

Said to yield an oil used in medicine; also burned.

XYLIA.

316 **Xylia dolabriformis,** *Benth.*, LEGUMINOSÆ.

THE IRONWOOD TREE OF PEGU AND ARRACAN.

Syn.—MIMOSA XYLOCARPA, *Roxb.*

Vern.—*Jambu,* HIND.; *Jamba,* MAR.; *Boja,* URIYA; *Irul,* TAM.; *Konda, tangedu, bojeh,* TEL.; *Pyinkado,* BURM.

A large, deciduous tree of the Chanda district, South India, Arracan, and Burma.

The seeds yield an oil. As this oil seems little known, samples and information as to extraction and economic uses would be most acceptable.

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OF THE CATALOGUE OF THE

ECONOMIC PRODUCTS OF INDIA,

EXHIBITED AT THE

Calcutta International Exhibition, 1883-84.

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Gum ; Oil ;
Aghádá, *Bom.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;
Aglay, *Tam.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Agnisikha, *Tel.*, Carthamus tinctoria, *Linn.*, COMPOSITÆ.
Dye ; Oil ;
Agru, *Tel.*, Aquilaria Agallocha, *Roxb.*, THYMELÆACEÆ.
Oil ;
Ahreo, *Sind*, Lepidium sativum, *Linn.*, CRUCIFERÆ.
Oil ;
Aich, *Beng.*, Morinda citrifolia, *Linn.*, var. citrifolia, RUBIACEÆ.
Dye ;
Aila, *Oudh*, Acacia concinna, *D.C.*, LEGUMINOSÆ.
Dye ; Tan ;
Aima, *Tam.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Ain, *Mar.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye : Tan ;
Aini, *Mal.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;
Aita, *Gond*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;
Ajeru, *Nepal*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;
Ajhar, *Ass.*, Lagerstrœmia Flos-Reginæ, *Rets.*, LYTHRACEÆ.
Gum ;
Ajowan, *Hind.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
Ak, *Hind.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Ak, *Hind.*, Calotropis procera, *R. Br.*, ASCLEPIADRÆ.
Gum ; Dye ; Tan. ; Fibre.

Ak, *Hind.*, *Beng.*, Morinda tinctoria, *Roxb.*, var. tinctoria, RUBIACEÆ.
Dye ;
Akaá, *Bom.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Akadu, *Bom.*, *Sind.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Akalber, *Hind.*, Datisca cannabina, *Linn.*, DATISCEÆ.
Dye ;
Akánd, *Beng.*, Calotropis gigantea, *R.Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Akasbel, *Hind.*, *Pb.*, Cuscuta reflexa, *Roxb.*, CONVOLVULAGEÆ.
Dye ;
Akásavel, *Bom.*, Cuscuta reflexa, *Roxb.*, CONVOLVULACEÆ.
Dye ;
Akher, *Kashmir*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;
Akhor, *Kashmir*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ;
Akhrot, *Hind.*, *Bom.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;
Akola, *Hind.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oil ;
Akoria, *N. W. P.*, Rhus Wallichii, *Hook. f.*, ANACARDIACEÆ.
Oil ;
Akra, *Bom.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Tan ; Fibre ;
Akrot, *Hind.*, *Bom.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oil ;
Akrut, *Beng.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;
Akyaw, *Burm.*, Aquilaria Agallocha, *Roxb.*, THYMELIÆACEÆ.
Gum ; Oil ;
Al, *Hind.*, Morinda citrifolia, *Linn.*, var. citrifolia, RUBIACEÆ.
Dye ;
Alá, *Bom.*, Morinda citrifolia, *Linn.*, var. citrifolia, RUBIACEÆ.
Dye ;
Al-abada, *And.*, Melochia velutina, *Beddome*, STERCULIACEÆ.
Fibre ;
Alale, *Mysore*, Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Oil ;
Alari, *Tam.*, Nerium odorum, *Soland*, APOCYNACEÆ.
Oil ;
Alarka, *Sans.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Alash, *Pb.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Alasi, *Bom.*, *Tel.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;
Alá thanda, *Beng.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Alder, *Nepal*, *Eng.*, Alnus nepalensis, *D. Don.*, BETULACEÆ.
Dye ; Tan ;
Aleverie, *Beng.*, Lepidium sativum, *Linn.*, CRUCIFERÆ.
Oil ;
Alexandrian Laurel, *Eng.*, Calopyllum inophyllum, *Linn.*, GUTTIFERÆ.
Oil ;
Algaroba, *Eng.*, Prosopis pallida, *Kunth.*, ROSACEÆ.
Tan ;
Algaroba of Texas, *Eng.*, Prosopis glandulosa, *Torr.*, LEGUMINOSÆ.
Gum ;
Algarobilla, *Eng.*, Prosopis pallida, *Kunth*, LEGUMINOSÆ.
Tan ;

Algusi, *Beng.*, Cuscuta reflexa, *Roxb.*, CONVOLVULACEÆ.
Dye ;
Ali, *Pb.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Alish, *Kashmir*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;
Alkalis, *Eng.* The ashes of several plants are used as substitutes.
Dye ;
Alla, *Hind.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Alla-bat-salta, *Tel.*, Basella cordifolia, *Lam.*, CHENOPODIACEÆ.
Dye ;
Allian, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;
Alli-cheddu, *Tel.*, Memecylon edule, *Roxb.*, MELASTOMACEÆ.
Dye ;
Almond, *Eng.*, Prunus amygdalus, *Baillon*, ROSACEÆ.
Gum ; Oil ;
Almond, Indian, *Eng.*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Oil ;
Almond, Java, *Eng.*, Canarium commune, *Linn.*, BURSERACEÆ.
Gum ; Oil ;
Aloe, *Germ.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;
Aloe, American, *Eng.*, Agave americana, *Linn.*, AMARYLLIDEÆ.
Fibre ;
Aloe, Bastard, *Eng.*, Agave vivipara, *Linn.*, AMARYLLIDEÆ.
Fibre ;
Aloe, Great, *Eng.*, Fourcroya gigantea.
Oil ;
Aloes, *Eng.*, *Fr.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;
Aloe-wood, *Eng.*, Aquilaria Agallocha, *Roxb.*, THYMELÆACEÆ.
Gum ;
Alshi-virai, *Tam.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;
Alsi, *Hind.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;
Alti, *Tam.*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Alu, *Cingh*, Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Alu balu, *Pers.*, Prunus Cerasus, *Linn.*, ROSACEÆ.
Gum ;
Alu-bu-ali, *Pers.*, Prunus Cerasus, *Linn.*, ROSACEÆ.
Gum ;
Alucha, *Pb.*, Prunus communis, *Huds.*, ROSACEÆ.
Gum ; Oil ;
Am, *Hind.*, *Beng.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;
Ama, *Bom.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;
Amadum, *Tel.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Amalgach, *Pb.*, Prunus Puddum, *Roxb.*, ROSACEÆ.
Gum ;
Amaltas, *Hind.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Amara, *Hind.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Amaravela, *Bom.*, Cuscuta reflexa *Roxb.* CONVOLVULACEÆ.
Dye

Amari, *Ass.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Amasúla, *Bomb.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Oil ;
Amb, *Beng.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Oil ;
Amba, *Mahr.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Oil ;
Amba, *Hind.*, *Bom.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Amba, *Bom.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;
Ambádá, *Bom.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Ambadi, *Bom.*, Crotalaria juncea, *Linn.*, LEGUMINOSÆ.
Fibre ;
Ambal, *Pb.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Oil ;
Ambarbarees, *Arab.*, Berberis Lycium, *Royle.*, BERBERIDEÆ.
Gum ;
Ambarabárísa, (fruit) Berberis aristata.
Dye ;
Ambaree, *Dec.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Ambari, *Gáro*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Ambári, *Dec.*, *Hind.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Ambhola, *Uriya*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Ambli, *Pb.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan. ;
Ambli, *Hind.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Amblu, *Pb.*, Phyllanthus nepalensis, *Mull. Arg.*, EUPHORBIACEÆ.
Tan ;
Ambodha, *Hind.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Ambolati, *Beng.*, Phyllanthus Emblica, *Linn*, EUPHORBIACEÆ.
Gum ; Dye ; Tan. ;
Amdi, *Tel.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Ami, *N. W. P.*, Rhus cortinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;
Amla, *Hind.*, *Beng.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Amli, *Hind.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Amli, *Hind.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Amlika, *Hind.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Amlosa, *Hind.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Amluki, *Ass.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Amluki, *Beng.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;
Amra, *Hind.*, *Beng.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Amra, *Sans.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Amrai, *Pb.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;
Amrer, *Jhelum*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Amrit phal, *Kumaun*, Citrus medica, *Linn.*, var. Limetta, RUTACEÆ.
Gum ; Tan ; Oil ;
Amru, *Sans.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Oil ;
Amrúd, *Hind.*, *N. W. P.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Amrút, *Hind.*, *N. W. P.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Amúdanda, *Pb.*, Berberis nepalensis, *Spreng.*, BERBERIDEÆ.
Dye ;
Amuk, *Nepal*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Amuki, *Nepal*, Kandia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Amulati, *Beng.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Amut, *Pb.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;
Anai-puliya-roy, *Tam.*, Adansonia digitata, *Linn.*, MALVACEÆ.
Fibre ;
Ananas, *Hind.*, Ananassa sativa, *Linn.*, BROMELLIACEÆ.
Fibre ;
Anander, *Jhelum*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;
Anar, *Hind.*, *Bom.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Anáras, *Beng.*, Ananassa sativa, *Linn.*, BROMELIACEÆ.
Fibre ;
Anar-kajhar, *Dec.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ;
Andara, *Cingh.*, Dichrostachys cinerea, *W. & A.*, LEGUMINOSÆ.
Gum ;
Anduga, *Tel.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Anduku, *Tel.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Anemui, *Tam.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Aneru, *Chenab*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Angharœhindi, *Arab*, *Pers.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Anghuzeh-i-Lari, *Pers.*, Ferula Narthex, *Boiss.*, UMBELLIFERÆ.
Gum ;
Ani-kundamani, *Tam.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Oils ;
Anil, *Cingh.*, Tephrosia tinctoria, *Pers.*, LEGUMINOSÆ.
Dye ;
Anise, Star, *Eng.*, Illicium Anisatum, *Linn.*, MAGNOLIACEÆ.
Oil ;
Anise seed, *Eng.*, Pimpinella Anisum, *Linn.*, UMBELLIFERÆ.
Oil ;
Anjabár, *Pb.*, Polygonum bistorta, *Linn.*, POLYGONACEÆ.
Oil ;
Anjabli, *Tam.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;
Anjan, *Hind.*, *Mahr.*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Anjan, *Hind.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ;

Anjan, *Bomb.*, Memecylon edule, *Roxb.*, MELASTOMACEÆ.
Dye ;

Anjudan, *Kashmir*, Ferula alliacea, *Boiss.*, UMBELLIFERÆ.
Gum ;

Ankudu, *Tel.*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;

Ankudu-kurra, *Tel.*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan. ;

Ansandra, *Tel.*, Acacia ferruginea, *DC.*, LEGUMINOSÆ.
Gum ;

Ansjeni, *Mal.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;

Antawála, *Cingh.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;

Ant-grease.
Oil ;

Anti-maduram, *Tam.*, Glycyrhiza glabra, *Linn.*, LEGUMINOSÆ.
Dye ;

Antmorá, *Beng.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;

Anvalá, *Bom.*, *Mahr.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;

Anzeroot, *Arab.*, *Pers.*, Astragalus ? sp., LEGUMINOSÆ.
Gum ;

Aonta, *Hind.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;

Aor, *Pb.*, Prunus persica, *Benth.*, ROSACEÆ.
Gum ; Oil ;

Apamarga, *Sans.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;

Apáng, *Beng.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;

Apim, *Beng.*, Papaver somniferum, *Linn.*, PAPAVERACEÆ.
Oil ;

Aporave, *Greek*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;

Apple, Custard, *Eng.*, Anona squamosa, *Linn.*, ANONACEÆ.
Fibre ;

Apricot, *Eng.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Gum ; Oil ;

Apta, *Mahr.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;

Apúng, *Chutia Nagpur*, Holostemma Rheedei, *Wall.*, ASCLEPIADEÆ.
Fibre ;

Apurs, *Beluchistan*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;

Arabic, Indian Gum, *Eng.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;

Aradal, *Kan.*, Garcinia Cambogia, *Desrouss.*, GUTTIFERÆ.
Gum ; Dye ;

Aradal, *Kan.*, Garcinia Morella, *Desrouss.*, GUTTIFERÆ.
Gum ; Tan. ; Oil ;

Arák, *Arab.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Arakbádián, *See* Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;

Arand, *Hind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;

Arang, *Berar*, Eriolæna Hookeriana, *W. & A.*, STERCULIACEÆ.
Fibre ;

Arang, *Berar*, Eriolæna spectabilis, *Planch.*, STERCULIACEÆ.

Fibre ;

Arar, *Hind.*, Randea dumetorum, *Lam.*, RUBIACEÆ.

Dye ;

Arasa, *Tam.*, Ficus religiosa, *Linn.*, URTICACEÆ.

Gum ; Tan ;

Aravi mamádi, *Tel.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.

Gum ;

Arawi nim, *Tel.*, Atalantia monophylla, *Corr.*, RUTACÆ.

Oil ;

Archu, *Tarai Garhwal*, Rheum Emodi, *Wall.*, POLYGONACEÆ.

Dye ;

Areca Nut, *Eng.*, Areca Catechu, *Linn.*, PALMÆ.

Gum ;

Areka, *Tam.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.

Gum ;

Arendi, *Hind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.

Mordant ; Oil ;

Ari, *Tel.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.

Gum ;

Arihai-ka-bel, *Sutlej*, Acacia Intsia, *Willd.*, LEGUMINOSÆ.

Dye ;

Aring, *Raj.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.

Gum ; Dye ;

Aristha, *Sans.*, Xanthium strumarium, *Linn.*, COMPOSITÆ.

Oil ;

Arján, *Pb.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.

Oil ;

Arjun, *Hind.*, *Beng.*, *Mahr.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.

Gum ; Dye ; Tan ;

Arjunna, *Oudh*, Croton oblongifolius, *Roxb.*, EUPHORBIACEÆ.

Oil ;

Ark, *Hind.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.

Gum ; Dye ; Tan ; Fibre ;

Ark, Safed-, *Hind.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.

Gum ; Dye ; Tan ; Fibre ;

Arka, *Sans*, Calotropis gigantea, *R.Br*, ASCLEPIADEÆ.

Gum ; Dye ; Tan ; Fibre ;

Arkhar, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.

Oil ;

Arkhar, *Pb.*, Rhus Wallichii, *Hook, f.*, ANACARDIACEÆ.

Oil ;

Arkol, *Pb.*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.

Gum ; Oil ;

Arkol, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.

Oil ;

Arkol, *Pb.*, Rhus Wallichii, *Hook, f.*, ANACARDIACEÆ.

Oil ;

Arlu, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.

Dye ; Tan ;

Arma, *Gond*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.

Gum ; Dye ;

Arnotto, (the seeds of) Bixa Orellana, *Linn.*, BIXINEÆ.

Arro, *Tel.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.

Gum ;

Arrodah, *And.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.

Gum ; Dye ;

Artso, *Pb.*, Rheum Emode, *Wall.*, POLYGONACEÆ.

Dye ;

Aru, *Pb.*, Prunus persica, *Benth.*, ROSACEÆ.

Gum Oil ;

Aru, *Mal.*, Casuarina equisetifolia, *Forster*, CASUARINACEÆ.
Gum ; Tan ;
Arúsa, *Hind.*, Adhatoda Vasica, *Nees.*, ACANTHACEÆ.
Dye ;
Arusha, *Chittagong*, Callicarpa cana, *Linn.*, VERBENACEÆ.
Fibre ;
Aryili, *Nepal*, Edgeworthia Gardneri, *Meisn.*, THYMELÆACEÆ.
Fibre ;
Asainda, *Hind.*, Ougeinia dalbergiodides, *Benth.*, LEGUMINOSÆ.
Gum ;
Asam, *Mysore* , Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Asan, *Hind.*, *Beng.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Asáná, *Mahr.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;
Asana, *Bom.*, *Mahr.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Asbarg, *Pb.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;
Asereki, *Tel.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Asfrak, *Pers.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;
Ashathwa, *Beng.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;
Ashta, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Asl-rai, *Hind.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Asna, *Hind.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Asok, *Hind.*, Polyalthia longifolia, *Benth. & Hook, f.*, ANONACEÆ.
Fibre ;
Asoka, *Bom.*, Polyalthia longifolia, *Benth. & Hook, f.*, ANONACEÆ.
Fibre ;
Asoká, *Tel.*, Polyalthia longifolia, *Benth. & Hook, f.*, ANONACEÆ.
Fibre ;
Asperag, *Pers.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;
Asphota, *Sans.*, Jasminum Sambac, *Aiton*, OLEACEÆ.
Oil ;
Aspraka, *Bom.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;
Asrelei, *Sindi*, Tamarix articulata, *Vahl.*, TAMARASCINEÆ.
Gum ;
Assain, *Hind.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Assalia, *Bom.*, Lepidium sativum, *Linn.*, CRUCIFERÆ.
Oil ;
Assar, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Assothi, *Tam.*, Polyalthia longifolia, *Benth. & Hook, f.*, ANONACEÆ.
Fibre ;
Assu, *Pb.*, Eruca sativa, *Lam.*, CRUCIFERÆ.
Oil ;
Asta, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;
Asúd, *Beng.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;
Asugach, *Ass.*, Morinda angustifolia, *Roxb.*, RUBIACEÆ.
Dye ;

Asúpála, *Bom.*, Polyalthia longifolia, *Benth. & Hook, f.*, ANONACEÆ.
Fibre ;

Asuri, *Nepal*, Tabernæmontana coronaria, *Willd.*, APOCYNACEÆ.
Dye ;

Asvamaraka, *Sans.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Aswat, *Beng.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;

Ata, *Beng.*, Anona squamosa, *Linn.*, ANONACEÆ.
Gum ;

Atasi, *Tel.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ;

Athiballa-chettu, *Tam.*, Sida rhombifolia, *Linn.*, MALVACEÆ.
Fibre ;

Ati, *Tam.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Atkumah, *Arab.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;

Atkuri, *Ass.*, Wrightia tomentosa, *Roem & Scheult.*, APOCYNACEÆ.
Dye ;

Atsu, *Pb.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Atta bar, *Beng.*, *Ass.*, Ficus elastica, *Bl.*, URTICACEÆ.
Gum ;

Atunete, *Tam.*, Æschynomene aspera, *Linn.*, LEGUMINOSÆ.
Fibre ;

Au, *Pb.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;

Auch, *Hind.*, *Beng.*, Morinda tinctoria, *Roxb.*, var. tinctoria, RUBIACEÆ.
Dye ;

Auk, *Nep.*, Calotropis gigantea, *R.Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Aura, *Hind.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;

Avalo, *Tel.*, Brassica nigra, *Koch*, CRUCIFERÆ.
Oil ;

Avarai, *Tam.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Avarike, *Kan.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Avest, *Tel.*, Sesbania grandiflora, *Pers.*, LEGUMINOSÆ.
Gum ;

Awe, *Hind.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;

Aya, *Tam.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;

Ayma, *Tam.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;

Ayni, *Tam.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;

B

Bab, *N. W. P.*, Eriophorum comosum, *Wall.*, CYPERACEÆ.
Fibre ;

Babari, *C. P.*, Ocimum sanctum, var. sanctum, LABIATÆ.
Oil ;

Bab-basant, *Pb.*, Linum strictum, *Linn.*, LINEÆ.
Oil ;

Babbur, *Sind.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Dye ;

Babela, *Pers.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Babila, *N. W. P.*, Eriophorum comosum, *Wall.*, CYPERACEÆ.
Fibre ;
Bábláá, *Beng.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;
Báboi tulsi, *Beng.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;
Babra, *Dec.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Babui, *Beng.*, *Hind.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;
Bábui ghás, *Beng.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;
Babui-tulsi, *Beng.*, *Hind.*, Ocimum Basilicum, *Linn.*, var. pilosum, *Benth.*, LABIATÆ. Fibre ; Oil ;
Bábúl, *Hind.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Tan ; Dye ;
Babul, *Dec.*, Pithecolobium dulce, *Benth.*, LEGUMINOSÆ.
Gum ;
Babul-Aas, (berry) *Bom.*, Myrtus communis, *Linn.*, MYRTACEÆ.
Oil ;
Babun-phul, *Beng.*, *Hind.*, Matricaria Chamomila, *Linn.*, COMPOSITÆ.
Oil ;
Bach, *Beng.*, *Hind.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oil ;
Bach, *Beng.*, Curcuma Zerumbet, *Roscoe* (*non-Roxb.*), SCITAMINEÆ.
Dye ;
Bach, **Mahaburi**, *Beng.*, Curcuma Zerumbet, *Roscoe* (*non-Roxb.*), SCITAMINEÆ. Dye ;
Bacha, *Bom.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Bad, *N. W. P.*, Andropogon laniger, *Desf.*, GRAMINEÆ.
Fibre ;
Bada, *Pb.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Badám, *Beng.*, Prunus amygdalus, *Baillon.*, ROSACEÆ.
Gum ; Oil ;
Badam, *Beng.*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Dye ; Oil ;
Badam Bhatia, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Badam, **Jangli**, *Hind.*, Sterculia fœtida, *Linn*, STERCULIACEÆ.
Oil ;
Badam, **Jangli**, *Hind.*, Canarium commune, *Linn.*, BURSERACEÆ.
Oil ;
Badar, *Afg.*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Bádar, *Him. name*, Abies Webbiana, *Lindl.*, CONIFERÆ.
Gum ; Dye ;
Bádiankhatáí (fruit) *Bom.*, Illicium anisatum, *Linn.*, MAGNOLIACEÆ.
Oil ;
Badídapu-chettu, *Tel.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Badu manu, *C. P.*, Sponia orientalis, *Planch.*, ANACARDIACEÆ.
Gum ; Fibre ;
Bael, *Eng.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Baer, *Hind.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ;
Bágá, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Baga-dhup, *Kan.*, Ailanthus malabarica, *DC.*, SIMARUBEÆ.
Gum ;
Bag-bherenda, *Hind.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;
Báhavá, *Mahr.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ;
Bahera, *Hind.*, *Beng.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Bahul, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Bai, *Beluchi*, Balsamodendron pubescens, *Stocks.*, BURSERACEÆ.
Gum ;
Baikal gaja chinni, *C.P.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Bainchi, *Beng.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Baishi, *Hind.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Bajra, *Pb.*, Penicillaria spicata, *Willd.*, GRAMINEÆ.
Dye ;
Bajir, *Pb.*, Polygonum bistorta, *Linn.*, POLYGONACEÆ.
Oil ;
Bakain, *Hind.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Bakainu, *Nepal.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Bakalwa, *Hind.*, Phyllanthus nepalensis, *Mull. Arg.*, EUPHORBIACEÆ.
Tan ;
Bakam, *Hind.*, *Gus.*, *Beng.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Bakamu, *Tel.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Bakapu, *Tel.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Bakarja, *Hind.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Bákas, *Beng.*, Adhatoda Vasica, *Nees.*, ACANTHACEÆ.
Dye ;
Bakáyan, *Hind.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Bakkiamela, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;
Bakli, *Hind.*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Bákli, *Hind.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Bakmo, *Uriya*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Bakra, *N. W. P.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;
Bakre-lara, *Paharia*, Hedyotis capitellata, *Wall.*, RUBIACEÆ.
Dye ;
Bakul, *Beng.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Bakuli, *Bom.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Bala, *Beng.*, Sida cordifolia, *Linn.*, MALVACEÆ.
Fibre ;
Bálachara, *Bom.*, Nardostachys Jatamansi, *DC.*, VALERIANACEÆ.
Oil ;
Balai, *Kan.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ;

Bálchiar, *Hind.*, Nardostachys Jatamansi, *DC.*, VALERIANACEÆ.
Oil ;
Balda, *Dec.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Balesán, *Arab.*, *Hind.*, Balsamodendron Opobalsamum, *Kunth.*, BURSERACEÆ. Gum ;
Balku, *Beng.*, Bambusa Balcooa, *Roxb.*, GRAMINEÆ.
Fibre ;
Bally Tree, *Eng.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Balsamocarpon, *Eng.*, Prosopis pallida, *Kunth.*, LEGUMINOSÆ.
Dye ;
Balut, *Afg.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Bamboo, *Eng.*, Melocanna bambusoides, *Trim.*, GRAMINEÆ.
Fibre ;
Bamboo, *Eng.*, Bambusa arundinacea, *Retz.*, GRAMINEÆ.
Fibre ;
Bamboo, Himalayan, *Eng.*, Arundinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;
Bamsutu, *Kashmir*, Cydonia vulgaris, *Tourn.*, ROSACEÆ.
Oil ;
Bamtsunt, *Kashmir*, Cydonia vulgaris, *Tourn.*, ROSACEÆ.
Oil ;
Bamya, *Arab.*, *Pers.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;
Ban, *Hind.*, Zizyphus vulgaris, *Lamk.*, RHAMNEÆ.
Gum ;
Ban, *Arab.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ;
Ban, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Ban, *N. W. P.*, Andropogon laniger, *Desf.*, GRAMINEÆ.
Fibre ;
Banafsha, *Hind.*, Viola serpens, *Wall.*, VIOLACEÆ.
Oil ;
Banana, *Eng.*, Musa sapientum, *Linn.*, MUSACEÆ.
Dye ; Fibre ;
Banbwe, *Burm.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;
Banda, *C. P.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Tan ;
Bandara, *Tel.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bandarlati, *Beng.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Bander siris, *Nepal*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Ban-dheras, *Beng.*, Hibiscus ficulneus, *Linn.*, MALVACEÆ.
Fibre ;
Bandhona, *Uriya*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;
Bandi gurivenda, *Tel.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Oil ;
Bandolat, *Cachar*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Bandriphal, *Nepal*, Amoora Rohituka, *W. & A.*, MELIACEÆ.
Oil ;
Bane, *Trans-Indus*, Periploca aphylla, *Decaisne*, ASCLEPIADEÆ.
Fibre ;
Bangali badam, *Bom.*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Oil ;

Bangra, *Beng.*, Wedelia calendulacea, *Less.*, COMPOSITÆ.
Dye ;

Banharia, *Hind.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Banjere, *Pb.*, Ocimum gratissimum, *Linn.*, LABIATÆ.
Oil ;

Bankati, *Hind.*, Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ.
Fibre ;

Ban lúdar, *Pb.*, *Him. name*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;

Banpálu, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;

Ban-patol, *Beng.*, Trichosanthes cucumerina, *Linn.*, CUCURBITACEÆ.
Gum ;

Bánraj, *Beng.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Ban-rithá, *Beng.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;

Bans, *Beng.*, Bambusa arundinacea, *Retz.*, GRAMINEÆ.
Fibre ;

Bans, *Hind.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;

Bans, *Hind.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;

Bans kaban, *Hind.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;

Bans kaban, *Hind.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;

Bans khurd, *Hind.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;

Bansu, *Chenab*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;

Bantaman, *Pb.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Bantil, *Pb.*, Impatiens Balsamina, *Linn.*, GERANIACEÆ.
Dye ;

Bantil, *Pb.*, Impatiens Edgeworthii, *Hook.*, GERANIACEÆ.
Oil ;

Baobab tree, *Eng.*, Adansonia digitata, *Linn.*, MALVACEÆ.
Fibre ;

Bar, *Beng.*, Ficus elastica, *Bl.*, URTICACEÆ.
Gum ;

Bara, *Nepal*, Quercus pachyphylla, *Kurz.*, CUPULIFERÆ.
Dye ; Tan ;

Bara baluka, *Ass.*, Bambusa Balcoora, *Roxb.*, GRAMINEÆ.
Fibre ;

Bara flawar, *Ass.*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;

Bara gorakuri, *Nepal.*, Viburnum coriacum, *Bl.*, CAPRIFOLIACEÆ.
Oil ;

Bara mai, *Hind.*, Tamarix Galls, *see* GALLS.
Dye ;

Bara ritha, *Beng.*, Sapindus trifoliatus, *Vahl.*, SAPINDACEÆ.
Gum ; Oil ;

Barásakápúra, *Bom.*, Dryobalanops Camphora, *Colebr.*, DIPTEROCARPEÆ.
Oil ;

Bara salpan, (*as in Roxb.*) *Beng.* and *Hind.*, Flemingia congesta, *Roxb.*, LEGUMINOSÆ. Dye ;

Barás camphor, *Bom.*, Dryobalanops Camphora, *Colebr.*, DIPTEROCARPEÆ.
Oil ;

Barbari, *Nepal.*, Beaumontia grandiflora, *Wall.*, APOCYNACEÆ.
Fibre ;

Barber, *Eng.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;

Barhal, *Hind.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Bariál, *Hind.*, Bauhinia acuminata, *Linn.*, LEGUMINOSÆ.
Oil ;

Bárik-tel, (seeds) *Dec.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;

Bari-máin, *Hind.*, *Sind.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;

Barma, *Kashmir*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;

Barmao, *Kumaun*, Phyllanthus nepalensis, *Mull. Arg.*, EUPHORBIACEÆ.
Tan ;

Barsanga, *Beng.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;

Barranga, *C.P.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;

Barrarra, *Trans-Indus*, Periploca aphylla, *Decaisne.*, ASCLEPIADEÆ.
Fibre ;

Bartandi, *Bom.*, Morinda citrifolia, *Linn.*, Var. critifolia, RUBIACEÆ.
Dye ;

Bartu, *Pb.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;

Barún, *Beng.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Barzad, *Pers.*, Ferula Galbaniflua, *Boiss.*, UMBELLIFERÆ.
Gum ;

Bas, *Bom.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;

Bas, *Bom.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;

Basant, *Pb.*, Linum strictum, *Linn.*, LINEÆ.
Oil ;

Basanti, *N. W. P.*, (color of) Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Bashal, *Pb.*, Salix daphnoides, *Vill.*, SALICINEÆ.
Fibre ;

Basil, Common, *Eng.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;

Basil, Sweet, *Eng.*, Ocimum Basilicum, *Linn.*, var. Anisatum, *Benth.*, LABIATÆ. Fibre ; Oil ;

Basna, *Hind.*, Sesbania grandiflora, *Pers.*, LEGUMINOSÆ.
Gum ;

Bast fibre, *Eng.*, Tilia europæa, *Linn*, TILIACEÆ.
Fibre ;

Bátávi nebu, *Beng.*, Citrus decumana, *Willd.*, RUTACEÆ.
Gum ;

Batia, *Jhelum*, *Chenab*, Periploca aphylla, *Decaisne.*, ASCLEPIADEÆ.
Fibre ;

Batia-rung, *Beng.*, Peristrophe tinctoria, *Nees.*, ACANTHACEÆ.
Dye ;

Batta, *Tel.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;

Bátú, *Hind.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Batwasi, *Nepal.*, Flemingia congesta, *Roxb.*, LEGUMINOSÆ.
Dye ;

Bavanchi, *Dec.*, Psoralea corylifolia, *Linn.*, LEGUMINOSÆ.
Oil ;

Bawaræ, *Garo.*, Semecarpus Anacardium, *Linn. f.*, ANACARDIACEÆ.
Gum ; Dye ;

Baxlhoa, *Pb.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bayi, *Beluchi.*, Balsamodendron pubescens, *Stocks*, BURSERACEÆ.
Gum ;
Bayr-bunja, *Sind.*, Datisca cannabina, *Linn.*, DATISCEÆ.
Dye ;
Bead Tree, *Eng.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Bed, *Hind.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Bed, *Pb.*, Salix daphnoides, *Vill.*, SALICINEÆ.
Fibre ;
Bed, *Pb.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Bed, *Pers.*, Calamus Rotang, *Linn.*, PALMÆ.
Fibre ;
Beefwood of Australia, *Eng.*, Casuarina equisetfolia, *Forster*, CASUARINACEÆ. Gum ; Tan ;
Begpura, *Beng.*, Citrus medica, *Linn.*, var. medica, RUTACEÆ.
Gum ; Tan ; Oil ;
Behara, *Hind.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Oil ;
Beheda, *Mahr.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Dye ; Tan ; Oil ;
Behra, *C. P.*, Chloroxylon Swietenia, *Adr. Juss.*, MELIACEÆ.
Gum ;
Beis, *Pb.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Bejalu, *Kan.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Bejaura, *Hind*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Bekkra, *Hind.*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;
Bekling, *Kanawar*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;
Bél, *Hind.*, *Beng.*, *Bom.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Bél, *Hind.*, *Beng.*, Jasminum officinale, *Aiton.*, OLEACEÆ.
Oil ;
Bélanri, *Pb.*, Polygonum bistorta, *Linn.*, POLYGONACEÆ.
Oil ;
Beleyleh, *Pers.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Oil ;
Bél fruit, *Eng.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Bellaip-polam, *Tam.*, Balsamodendron Myrrha, *Nees.*, BURSERACEÆ.
Gum ;
Belutta-champagam, *Mal.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Oil ;
Bemadá, *And.*, Albezzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;
Ben, *Burm.*, Amomum Subulatum, *Roxb.*, SCITAMINEÆ.
Oil ;
Ben-dhenras, *Beng.*, Hibiscus ficulneus, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Bendi, *Gus.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Bengha, *Kan.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Benne-oil, *Fr.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;

Bent, *Hind.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Bentha, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;

Benzoin *see* Styrax Benzoni.
Oil ;

Benzoin, Gum, Styrax Benzoin, *Dryand.*, STYRACEÆ.
Gum ;

Ber, *Hind.*, *Beng.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Dye ; Tan ;

Ber, *N. W. P.*, Zizyphus nummularia, *W. & A.*, RHAMNEÆ.
Gum ;

Berase of Soda, *see* Borax.
Dye ;

Berela, *Beng.*, Sida cordifolia, *Linn.*, MALVACEÆ.
Fibre ;

Berfa, *W. Tibet.*, Populus balsamifera, *Linn.*, SALACINEÆ.
Gum ;

Beri, *Hind.*, Zizyphus xylopyra, *Willd.*, RHAMNEÆ.
Tan ;

Berkung, *Lepcha*, Eriobotrya bengalensis, *Hook, f.*, ROSACEÆ.
Dye ;

Bet, *Beng.* ? Peristrophe tinctoria, *Nees.*, ACANTHACEÆ.
Dye ;

Bet, *Beng.*, *Hind.*, Calamus Rotang, *Linn.*, PALMÆ.
Fibre ;

Betain, *Kumaun*, Melia Azadirachta, *Linn.*, MELIACEÆ
Gum ;

Betamu, *Tel.*, Calamus Rotang, *Linn.*, PALMÆ.
Fibre ;

Betain, *Hind.*, Melia Azedarach *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;

Betar, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;

Betel Palm, *Eng.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ;

Betsa, *Pb.*, alix daphnoides, *Will.*, SALICINEÆ.
Fibre ;

Bettar, *Pb.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;

Bettir, *N. W. P.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;

Betula, or Birch, *Eng.*, Betula alba, *L.*, CUPULIFERÆ.
Oil ;

Betwa, *Cachar*, Bambusa Balcooa, *Roxb.*, GRAMINEÆ.
Fibre ;

Bevijin, *Burm.*, Banhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;

Beymadá, *And.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Bhábar, *N. W. P.*, Eriophorum comosum, *Wall.*, CYPERACEÆ.
Fibre ;

Bhagmili, *Nepal.*, Rhus semialata, *Murray.*, ANACARDIACEÆ.
Oil ;

Bhai-koi, *Bom.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;

Bhains, *N. W. P.*, Salix Wallichiana, *And.*. SALICINEÆ.
Fibre ;

Bhaira, *Hind.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Bhakti-chettu, *Tel.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Oil ;

Bhalai, *Nepal*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhálaio, *Nepal*, Rhus Wallichii, *Hook.*, *f.*, ANACARDIACEÆ.
Oil ;
Bhalen, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bhalia, (as in Gamble) *Beng.*, *Hind.*, Flemingia congesta, *Roxb.*, LEGUMINOSÆ. Dye ;
Bhalia, *Hind.*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Gum ; Dye ;
Bhaliun, *N. W. P.*, Rhus Wallichii, *Hook.*, *f.*, ANACARDIACEÆ.
Oil ;
Bhallia, *Uriya*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhamina, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bhán, *Pb.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;
Bhand, *Pb.*, (root of) Geranium nepalense, *Sweet.*, GERANIACEÆ.
Dye ;
Bhang, *Hind.*, *Beng.*, *Bom.*, *Tam.*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre ; Oil ;
Bhang-jalá, *Pb.*, Datisca cannabina, *Linn.*, DATISCEÆ.
Dye ;
Bhangli, *N. W. P.*, Salix Wallichiana, *And.*, SALICINEÆ.
Fibre ;
Bhanjiri, Perilla ocimoides, *Linn.*, LABIATÆ.
Oil ;
Bhánrá, *Hind.*, Wedelia calendulacea, *Less.*, COMPOSITÆ.
Dye ;
Bhara, *Beng.*, Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Tan ;
Bhara bar, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;
Bharbhánd, *Hind.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Oil ;
Bhat, *Hind.*, Glycine Soja, *Lieb.*, LEGUMINOSÆ.
Oil ;
Bhátavarná, *Bom.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;
Bhat kateya, *Pb.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ;
Bhatniggi, *Pb.*, Wikstromia virgata, *Meisn.*, THYMELÆACEÆ.
Fibre ;
Bhatwan, *Hind.*, Glycine Soja, *Lieb.*, LEGUMINOSÆ.
Oil ;
Bhaulan, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bhauri, *Beng.*, Symplocos theæfolia, *Ham.*, STYRACEÆ.
Dye ;
Bhedara, *N. W. P.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;
Bhekal, *Hind.*, Prinsepia utilis, *Royle.*, ROSACEÆ.
Oil ;
Bhela, *Beng.*, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhelatuki, *Beng.*, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhenda, *Hind.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Bhenda, *Mahr.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;

Bhendi, *Tam.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;
Bhendi, *Mahr.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Dye ; Fibre ;
Bhendu, *Hind.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;
Bhengal, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Bhenwa, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Bherda, *Mahr.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Bherlá Máda, *Mahr.*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;
Bherunda, *Beng.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Bhes, *Hind.*, Acacia latronum, *Willd.*, LEGUMINOSÆ.
Fibre ;
Bhesh, *Garo*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Bheyla, *Hind.*, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhi, *Ass.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ; Fibre ;
Bhilavan, *Dec.*, Semecarpus Anacardium, *Linn., f.* ANACARDIACEÆ.
Gum ; Tan ;
Bhilawa, *Hind.*, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Bhimal, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Bhímasení kapura, *Bom.*, Dryobalanops Camphora, *Colebr.*, DIPTEROCARPEÆ. Oil ;
Bhindi, *Hind.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Bhohar, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Bhojpatra, *Bom.*, Betula Bhojpattra, *Wall.*, CUPULIFERÆ.
Fibre ;
Bhokar, *Hind.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Bhokara, *Mahr.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ;
Bholia, *Hind.*, Symplocos spicata, *Roxb.*, STYRACEÆ.
Dye ;
Bhonder, *Gond.*, Eriolæna Hookeriana, *W. & A.*, STERCULIACEÆ.
Fibre ;
Bhonder, *Gond.*, Eriolæna spectabilis, *Planch.*, STERCULIACEÆ.
Fibre ;
Bhor, *Mar.*, Zizyphus Jujuba, *Lam.*, RHAMNEÆ.
Dye ; Tan ;
Bhorgoti, *Mahr.*, Zizyphus xylopyra, *Willd.*, RHAMNEÆ.
Tan ;
Bhotiá bádám, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Bhoti, *C.P.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;
Bhuishenga, *Bom.*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oil ;
Bhujpattra, *Hind.*, Betula Bhojpattra, *Wall.*, CUPULIFERÆ.
Fibre ;
Bhunja, *Kumaun*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;

Bhurbhur, *N. W. P.*, Cnicus arvensis, *Hoffm.*, COMPOSITÆ.
Oil ;

Bhurkar, *Hind.*, Hymenodictyon excelsum, *Wall*, RUBIACEÆ.
Tan ;

Bhur-kuri, *Bom.*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;

Bhutan kusam, *Tel.*, Croton oblongifolius, *Roxb.*, EUPHORBIACEÆ.
Oil ;

Bhutápálá, *Mahr.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;

Bhyratti, *see* Gossypium herbaceum, *L.* var. herbaceum MALVACEÆ.
Fibre ;

Bibalá, *Bom.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Bibba, *Mahr.*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Dye ;

Bich-tarak, *Beng.*, *Hind.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oil ;

Bichua, *Hind.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;

Bidái, *Pb.*, Salix daphnoides *Vill.*, SALICINEÆ.
Fibre ;

Bihi, *Hind.*, Cydonia vulgaris, *Tourn.*, ROSACEÆ.
Oil ;

Bihri, *C. P.*, Chloroxylon Swietenia, *Adr. Juss.*, MELIACEÆ.
Gum ;

Bija, *Hind.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Bijapúra, *Bom.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ; Oil ;

Bijasal, *Hind.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Bijasar, *Hind.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Bijaura, *Hind.*, Citrus medica, *Linn.*, var. medica, RUTACEÆ.
Gum ; Tan ; Oil ;

Bijband, *Hind.*, Sida cordifolia, *Linn.*, MALVACEÆ.
Fibre ;

Bijori, *Bom.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;

Bij-palak, *Pb.*, Spinacia oleracea, *Mill.*, CHENOPODIACEÆ.
Oil ;

Bila, *Hind.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Biladur, *Pers.*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Gum ; Dye ;

Bilapatri, *Kan.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ;

Bilási, *Hind.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Bili jali, *Kan.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;

Bilin, *Hind.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;

Billi matti, *Mysore*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Billu, *Tel.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;

Bilsa, *Oudh*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Bilva-pandu, *Tel.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;

Bina, *Beng.*, Avicennia officinalis, *Linn.*, VERBENACEÆ.
Tan ;
Bine, *Kan.*, Corypha umbraculifera, *Linn.*, PALMÆ.
Fibre ;
Bira-kaya, *Tel.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;
Birama-dandu, *Tam.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Oil ;
Birch, *Eng.*, Betula alba, *L.*, CUPULIFERÆ.
Oil ;
Bireez, *Pers.*, Ferula Galbaniflua, *Boiss.*, UMBELLIFERÆ.
Gum ;
Birmi, *Kashmir*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Bis, *Pb.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ,
Bisa, *Pb.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Bisfáig, *Pb.*, Adiantum Cappilus Veneris, *Linn.*, FILICES.
Oil ;
Bish, *Beng.*, Melocanna bambusoides, *Trim.*, GRAMINEÆ.
Fibre ;
Bishop's weed, True, *Eng.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
Bisjang, *Ass.*, Canarium bengalense, *Roxb.*, BURSERACEÆ.
Gum ;
Bislómbí, *Hind.*, Cucumis trigonus, *Roxb.*, CUCURBITACEÆ.
Oil ;
Bithúa, *Hind.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Bitsa, *Pb.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Biul, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Biung, *Hind.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;
Blackwood of S. India, *Eng.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Boddama kaia, *Tel.*, Cucumis trigonus, *Roxb.*, CUCURBITACEÆ.
Oil ;
Bodula, *Hind.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;
Boga, *see* Gossypium herbaceum, *L.* var. Herbaceum, MALVACEÆ.
Fibre ;
Boga poma, *Ass.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Bogi-vitulu, *Tel.*, Psorelia corylifolia, *Linn* , LEGUMINOSÆ.
Oil ;
Bohari, *Beng.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Bohera, *Beng.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Oil ;
Bohl, *Beng.*, *Mahr.*, Mimusops Ellengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Boho-dari, *Beng.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Boja, *Uriya*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Gum ; Oil ;
Bojeh, *Tel.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Oil ;
Bokal, *Kan.*, Mimusops Elengi, *Linn.* SAPOTACEÆ.
Gum ; Oil ;

Bokhar, *Mahr.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Fibre ;
Boklu, *Kan.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Oil ;
Boktok, *Lepcha*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;
Bol, *Beng.*, Balsamodendron Myrrha, *Nees.*, BURSERACEÆ.
Gum ;
Bola, *Sans.*, Balsamodendron Myrrha, *Nees.*, BURSERACEÆ.
Gum ;
Bola, *Beng*, Hibiscus tiliaceus, *Linn.*, MALVACEÆ.
Fibre ;
Bolchú, *Garo*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Bole siyah, *Pers.*, Aloe vera, *L.*, LILIACEÆ.
Dye ; Fibre ;
Bolsal, *Garo*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ;
Bomma kachika, *Tel.*, Costus speciosus, *Sm.*, SCITAMINEÆ.
Oil ;
Boomaiza, *Burm.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;
Bora, *Mahr.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Tan ;
Boraillí, *see* Gossypium herbaceum, L., var. herbaceum, MALVACEÆ.
Fibre ;
Borara, *Uriya*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Borla, *Kumaun*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Bosha, *Gondi*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Boura, *Beng.*, Macaranga indica, *Wight*, EUPHORBIACEÆ.
Gum ;
Bouro, *Uriya*, Bombax malabaricum. *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Bowla, *Pb.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Bozaganj, *Hind.*, Pistacia vera, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;
Brahmadundie, *Sans.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ; Oils ;
Brarna, *Hind.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;
Bread-fruit Tree, *Eng.*, Artocarpus incisa, *Linn.*, URTICACEÆ
Gum ;
Bren, *Pb.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;
Brindall, *Goa Port.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;
Brindáo, *Bom.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;
Bringaraja, *Sans.*, Wedelia calendulacea, *Less.*, COMPOSITÆ.
Dye ;
Bu, *Burm.*, Lagenaria vulgaris, *Seringe*, CUCURBITACEÆ.
Oil ;
Buchanaka, *Sans.*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oil ;
Buckche, *Hind.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Buda durmi, *Tel.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;

Budgrat, *Nepal*, Quercus lamellosa, *Sm.*, CUPULIFERÆ.
Tan ;

Budide gummadi, *Tel.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;

Buhul, *Beng.*, Cordya Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;

Bujjerbhang, *Hind.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;

Buk, *Lepcha*, Quercus lamellosa, *Sm.*, CUPULIFERÆ.
Tan ;

Buka, *Beng.*, Sesbania grandiflora, *Pers.*, LEGUMINOSÆ.
Gum ;

Bukal, *Beng.*, *Mahr.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Oil ;

Bukhain, Melia sempervirens, *Sw.*, MELIACEÆ.
Gum ;

Bulali, *Tam.*, Givotia rottleriformis, *Griff.*, EUPHORBIACEÆ.
Oil ;

Bullock's heart, *Eng.*, Anona reticulata, *Linn.*, ANONACEÆ.
Dye ; Fibre :

Bulu, *Cingh.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Bulyettra, *Nep.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Bunkápas, *Beng.*, Thespesia Lampas, *Dalz.*, MALVACEÆ.
Fibre ;

Bun-kapas, *Beng.*, Hibiscus tiliaceus, *Linn.*, MALVACEÆ.
Fibre ;

Bun-mulika, *Hind.*, *Beng.*, Jasminum Sambac, *Aiton.*, OLEACEÆ.
Oil ;

Bun-ochra, *Beng.*, Urena lobata, *Linn.*, MALVACEÆ.
Fibre ;

Bun-okra, *Beng.*, Xanthium strumarium, *Linn.*, COMPOSITÆ.
Oil ;

Bunrhea, *Ass.*, Villebrunea appendiculata, *Wedd.*, URTICACEÆ.
Fibre ;

Bun tulsi, *Beng.*, Ocimum adescendens, *Willd.*, LABIATÆ.
Oil ;

Buraga, *Tel.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Bura-manda, *Beng.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Tan ;

Buraye, *Sind.*, Periploca aphylla, *Decaisne.*, ASCLEPIADEÆ.
Fibre ;

Búrdá, *And.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Búrga, *Tel.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Burg morad, *Pb.*, Myrtus communis, *Linn.*, MYRTACEÆ.
Oil ;

Búrgú, *Tel.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Burgua, *Tel.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;

Buri, *Beng.*, Symplocos spicata, *Roxb.*, STYRACEÆ.
Dye ;

Burj, *Pb.*, Betula Bhojpattra, *Wall.*, CUPULIFERÆ.
Fibre ;

Burkai, *Tel.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Buroweh, *see* Gossypium herbaceum, *L.*, var. herbaceum, MALVACEÆ. Fibre ;

Burus, *Tam.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;
Burute, *Cingh.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;
Burzal, *Pb.*, Betula Bhojpattra, *Wall.*, CUPULIFERÆ.
Fibre ;
Bút, *Beng.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Butalli, *Tam.*, Givotia rottleriformis, *Griff.*, EUPHORBIACEÆ.
Oil ;
Butter.
Oil ;
Butter Tree, Indian, *Eng.*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oil ;
Bwéchin, *Burm.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Bwéchin, *Burm* , Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Bwir, *Pb.*, Salix Wallichiana, *And.*, SALICINEÆ.
Fibre ;
Byasa, *Uriya*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Byoo, *Burm.*, Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Dye ;
Byubo, *Burm.*, Bruguiera gymnorhiza, *Lam.*, RHIZOPHOREÆ.
Tan ;

C

Caatsiragum, *Tam.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Cachore, *Fr.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;
Cajput oil tree, *Eng.*, Malaleuca Leucadendron, *Linn.*, MYRTACEÆ.
Oil ;
Calamus, Sweet, *Eng.*, Andropogon schœnanthus, *Linn.*, GRAMINEÆ.
Oil ;
Candle Nut, *Eng.*, Aleurites moluccana, *Willd*, EUPHORBIACEÆ.
Gum ; Oil ;
Cane, Rattan, *Eng.*, Calamus Rotang, *Linn.*, PALMÆ.
Fibre ;
Cane-Sugar, *Eng.*, Saccharum officinarum, *Linn.*, GRAMINEÆ.
Fibre ;
Cangu, *Tam.*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Caoutchouc, *Eng.*
Gum ;
Caraway seed, *Eng.*, Carum Carui, *Linn*, UMBELLIFERÆ.
Oil ;
Cardamom, the Lesser, *Eng.*, Elettaria Cardamomum, *Maton.*, SCITAMINEÆ. Oil ;
Cardol (Oil) *Eng.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Dye ; Oil ;
Carin-siragum, *Tam.*, Nigella sativa, *Linn.*, RANUNCULACEÆ.
Oil ;
Carob Tree, *Eng.*, Ceratonia siliqua, *Linn.*, LEGUMINOSÆ.
Gum ;
Carrot, *Eng.*, Daucus Carota, *Linn*, UMBELLIFERÆ.
Oil ;
Carthame, *Fr.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ;

Cashew-apple-oil, *see* Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Oil ;
Cashew Nut, *Eng.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Cassia, **Fœtid,** *Eng.*, Cassia Tora, *Linn*, LEGUMINOSÆ.
Dye ;
Cassia, **Lignea,** *Eng.*, Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ;
Cassie, *Eng.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ;
Castor oil, *Eng.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Catechu, gum, *Eng.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Catechu, **Pale,** *Eng.*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan ;
Catappa, *Malay*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Dye ; Oil ;
Cattimandu, Euphorbia Cattimandoo, *Elliot.*, EUPHORBIACEÆ.
Gum ;
Cedar, Bastard, *Eng.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Oil ;
Cedar, Bastard, *Eng.*, Guazuma tomentosa, *Kunth.*, STERCULIACEÆ.
Fibre ;
Cedar, Himalayan, *Eng.*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Gum ; Oil ;
Cedratier, *Fr.*, Citrus medica, *Linn.*, *Var.* medica, RUTACEÆ.
Gum ; Tan ; Oil ;
Cedro, *It.*, Citrus medica, *Linn.*, *Var*, medica, RUTACEÆ.
Gum ; Tan ; Oil ;
Cha, *Hind.*, *Beng.*, Camellia theifera, *Griff.*, TERNSTRŒMIACEÆ.
Oil ;
Chab, *Hind.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;
Chachinda-jangli, *Hind.*, Trichosanthes cucumerina, *Linn.*
Gum ;
Chaffalsend, *Dec.*, Opuntia Dillenii, *How.*, CACTEÆ.
Fibre ;
Chaga, *Tel.*, Sanseviera zeylanica, *Willd.*, LILIACEÆ.
Fibre ;
Chagulbanti, *Beng.*, Dœmia extensa, *R. Br.*, ASCLEPIADEÆ.
Fibre ;
Chaiára, *Kumaun*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oil ;
Chaie choi, *Beng.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;
Chaikath, *Beng.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;
Chainchar, *Jhelum*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Chainjli, *Jhelum*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Chakotra, *Hind.*, Citrus decumana, *Willd.*, RUTACEÆ.
Gum ;
Chakra-bhenda, *Dec.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Chakua, *Beng.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;
Chakunda, *Hind.*, *Beng.*, Cassia Tora, *Linn.*, LEGUMINOSÆ.
Dye ;
Chakwa, *Beng.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;

Chalai, *Him. name*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;
Chalcahalira, *Pb.*, Parmelia kamtschadalis, *Esch.*, LICHENES.
Dye ;
Chal-kumra, *Pb.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Challa, *Kan.*, Lagerstrœmia Flos-Reginæ, *Rets.*, LYTHRACEÆ.
Gum ;
Chalpuri, *Pb.*, Parmelia kamtschadalis, *Esch.*, LICHENES,
Dye ;
Chamaindu-pu, *Tam.*, Matricaria Chamomila, *Linn.*, COMPOSITÆ.
Oil ;
Chamarkas, *Pb.*, Phyllanthus nepalensis, *Müll-Arg.*, EUPHORBIACEÆ.
Tan ;
Chamba, *Hind.*, *Kashmir.*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;
Chamba, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Chambel, *Hind.*, *Beng.*, *Sans*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;
Chambéli, *Bom.*, *Kumaun*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;
Chambu, *Garo*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye, ; Tan ;
Chambuli, *Dec.*, *Mahr.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ; Fibre ;
Chambura, *Mahr.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ; Fibre ;
Chamiari, *Pb.*, Prunus Puddum, *Roxb.*, ROSACEÆ.
Gum ;
Chamlani, *Nepal.*, Symplocos racemosa, *Roxb.*, STYRACEÆ.
Dye ; Tan ; Mordant ;
Chamlia, *Kumaun.*, Wikstromia virgata, *Meisn.*, THYMELÆACEÆ.
Fibre ;
Chamo, *Lepcha*, Styrax serrulatum, *Roxb.*, STYRACEÆ.
Gum ;
Chamomile, *Eng.*, Matricaria Chamomila, *Linn.*, COMPOSITÆ.
Oil ;
Champa, *Hind.*, *Beng.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Dye ; Oil ;
Champák, *Beng.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Dye ;
Champaka, *Beng.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Oil ;
Chamru, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;
Chaná, *Hind.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Chanangi, *Hyderabad*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Chanda, *Mahr.*, Macaranga indica, *Wight*, EUPHORBIACEÆ.
Gum ;
Chanda, *Bom.*, Macaranga tomentosa, *Wight*, EUPHORBIACEÆ.
Gum ;
Chándakudá, *Bom.*, Antiaris toxicaria, *Leech.*, URTICACEÆ.
Gum ;
Chandal, *Hind.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;
Chándala, *Bom.*, Antiaris toxicaria, *Leech.*, URTICACEÆ.
Gum ;
Chandan, *Hind.*, *Beng.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Chandan, *Hind.*, *Beng.*, Symplocos phyllocalyx, *Clarke*, STYRACEÆ.
Dye ;
Chandni, *Hind.*, Tabernæmontana coronaria, *Willd.*, APOCYNACEÆ.
Dye ;
Changathasi dhup, *Nepal.*, Abies dumosa, *Loudon.*, CONIFERÆ.
Gum ;
Changma, *W. Tibet*, Populus balsamifera, *Linn.*, SALICINEÆ.
Gum ;
Changma, *W. Tibet*, Salix daphnoides, *Vill.*, SALICINEÆ.
Fibre ;
Chaniát, *N. W. P.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;
Chapkia, *Kumaun*, Orthanthera viminea, *Wight*, ASCLEPIADEÆ.
Fibre ;
Chaplash. *Beng.*, Artocarpus Chaplasha, *Roxb.*, URTICACEÆ.
Gum ;
Chápu, *Pb.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan ;
Char, *C. P.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Chara, *Tel.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Charachi, *Tel.*, Grewia tiliæfolia, *Vahl.*, TILIACEÆ.
Fibre ;
Charas, *Hind.*, *Beng.*, *Bom.*, *Tam.*, Cannabis sativa, *Linn* , URTICACEÆ.
Fibre ;
Charchubila, *Pb* , Parmelia kamtschadalis, *Esch.*, LICHENES.
Dye ;
Charila, *Pb.*, Parmelia kamtschadalis, *Esch.*, LICHENES.
Dye ;
Charka, *Bias.*, Litsæa, *Sp.* ?, LAURINEÆ.
Oil ;
Charkha, *Pb.*, Litsæa zeylanica, *Nees.*, LAURINEÆ.
Oil ;
Charmaghy, *Pers.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ;
Charole, *Bom.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Charrei, *Afg.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Charu, *Uriya*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Charwari, *Hyderabad*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Chashing, *Bhutia*, Symplocos theæfolia, *Ham.*, STYRACEÆ.
Dye ;
Chatri, *Nepal*, Berberis nepalensis, *Spreng.*, BERBERIDEÆ.
Dye ;
Chatung, *Kashmir*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Chauri, *Sind*, Ceriops Candolleana, *Arnott*, RHIZOPHOREÆ.
Tan ;
Chaulmicgri, *Beng.*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Chaulmugra oil, *Eng.*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Chavika, *Sans.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;
Chaya, *Burm.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Tan ;
Chay root, (*Commercial name*) Oldenlandia umbellata, *Linn.*, RUBIACEÆ.
Dye ;

Che, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Chechar, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;
Chehur, *Beng.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Chein, *Sutlej*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Chelwa, *Beng.*, Hibiscus tiliaceus, *Linn.*, MALVACEÆ.
Fibre ;
Chendra, *Tel.*, Mallotus philippinensis, *Müll-Arg.*, EUPHORBIACEÆ.
Oil ;
Chengrung, *Garo*, Morinda angustifolia, *Roxb.*, RUBIACEÆ.
Dye ;
Chenna, *Hind.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Chenthakanni, *Mysore*, Macaranga tomentosa, *Wight*, EUPHORBIACEÆ.
Gum ;
Chenung, *Garo*, Morinda angnstifolia, *Roxb.*, RUBIACEÆ.
Dye ;
Cheppura, *Kan.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Cheri-vello, *Tel.*, Oldenlandia umbellata, *Linn.*, RUBIACEÆ.
Dye ;
Cherry, *Eng.*, Prunus Cerasus, *Linn.*, ROSACEÆ.
Gum ;
Cheru pinnay, *Tam.*, Calophyllum Wightianum, *Wall.*, GUTTIFERÆ.
Oil ;
Chestnut, *Eng.*, Castanopsis (various species), CUPULIFERÆ.
Tan ;
Chetippa, *Tel.*, Hymenodictyon excelsum., *Wall.*, RUBIACEÆ.
Tan ;
Chettu, *Tel.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Cheuli, *Oudh.*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oil ;
Chhagul-puputi, *Beng.*, Euphorbia dracunculoides, *Lam.*, EUPHORBIACEÆ.
Oil ;
Chhota aryili, *Nepal*, Daphne Wallichii, *Meisn.*, THYMEIÆACEÆ.
Fibre ;
Chhota Kúail, *Nepal*, Pouzolia viminia, *Wedd.*, URTICACEÆ.
Fibre ;
Chiára, *Kumaun*, Bassia butyraceæ, *Roxb.*, SAPOTACEÆ.
Oil ;
Chibuda, *Bom.*, Cucumus Melo, *L.*, CUCURBITACEÆ.
Oil ;
Chichia, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;
Chichra, *Hind.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;
Chicken pea, *Eng.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Chikaya, *Tel.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Chikrása, *Bom.*, Chikrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Chikrassi, *Beng.*, Chikrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Chikti, *Hind.*, Triumfetta angulata, *Linn.*, TILIACEÆ.
Fibre ;
Chil, *Pb.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ;

Chil, *Pb.*, Pinus excelsa, *Wall.*, CONIFERÆ.
Gum ;
Chil, *Pb.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;
Chilbil, *Hind.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Chilgoza, *Afg.*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Gum ; Oil ;
Chilkaduda, *Tel.*, Saccopetalum tomentosum, *Hook.*, *f.*, ANONACEÆ.
Gum ;
Chilotu, *Ravi*, Litsæa, *Sp*?, LAURINEÆ.
Oil ;
Chilotu, *Pb.*, Litsæa zeylanica, *Nees.*, LAURINEÆ.
Oil ;
Chilta-eita, *Tel.*, Phœnix farinefera, *Willd.*, PALMÆ.
Fibre ;
Chimdi, *Pb.*, Litsæa zeylanica, *Nees*, LAURINEÆ.
Oil ;
Chimuti, *Tel.*, Sida carpinifolia, *Linn.*, MALVACEÆ.
Fibre ;
Chinangi, *Tel.*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ;
Chinannu, *Pb.*, Prunus persica, *Benth. et Hook. f.*, ROSACEÆ.
Gum ; Oil ;
Chincha, *Mahr.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Oil ;
Chinderpang, *Garo*, Mallotus philippinensis, *Müll-Arg.*, EUPHORBIACEÆ.
Oil ;
Chindi, *Ravi*, Litsæa, *Sp.*?, LAURINEÆ.
Oil ;
Chiner-bádám, *Beng.*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oil ;
Chinna moral, *Tel.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;
Chinta, *Tel.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Chinyóp, *Burm.*, Gruga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Chir, *Pb.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ; Oil ;
Chir, *Pb.*, Pinus excelsa, *Wall.*, CONIFERÆ.
Gum ;
Chíra, *Pb.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ;
Chirauli, *Pb.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Chir-chira, *Hind.*, Litsæa zeylanica, *Nees.*, LAURINEÆ.
Oil ;
Chirchira, *Hind.*, Achyranthes aspera, *Linn*, AMARANTACEÆ.
Dye ;
Chir-chira, *Kumaun*, Litsæa consimiles, *Nees.*, LAURINEÆ.
Oil ;
Chirchitta, *Hind.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;
Chiri, *Him. name*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Gum ; Oil ;
Cirichog, *Kashmir*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;
Chirira, *Kumaun*, Litsæa consimiles, *Nees.*, LAURINEÆ.
Oil ;
Chirndi, *Chenab.*, Litsæa, *Sp.*?, LAURINEÆ.
Oil ;

Chironji, *Pb.*, *C. P.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Chiror, *Pb.*, Berberis nepalensis, *Spreng.*, BERBERIDEÆ.
Dye ;
Chiroroe, *Garo*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Chite-ancallo, *Tel.*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;
Chitimuti, *Tel.*, Sida carpinifolia, *Linn.*, MALVACEÆ.
Fibre ;
Chitompa, *Garo*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Chitra, *Hind.*, *Pers.*, *Pb.*, *Nepal*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan : Oil ;
Chitta, *Kan.*, Gardenia gumnifera, *Linn.*, RUBIACEÆ.
Gum ;
Chittagong wood, *Eng.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ;
Chitta matta, *Tel.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;
Chittania, *Hind.*, Zizyphus xylopyra, *Willd.*, RHAMNEÆ.
Tan ;
Chittu, *Kan.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Chobchini, *Hind*, Smilax china, *Linn.*, LILIACEÆ.
Oil ;
Choka. *Dec.*, Piper nigrum, *Linn.*, PIPERACEÆ
Oil ;
Cholá, *Beng.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Chorgu, *Hyderabad*, Ventilago madraspatana, *Gaertn.*, RHAMNEÆ.
Gum ; Dye : Fibre ;
Chorpatta, *Beng.*, Laportea crenulata, *Gandich.*, URTICACEÆ.
Fibre ;
Chota, *Nepal*, Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ;
Chota-eláchi, *Beng.*, *Hind.*, Elettaria Cardamomum, *Maton*, SCITAMINEÆ.
Oil ;
Chota kimbu, *Nepal*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Chota kúail, *Nepal*, Ponzolzia viminea, *Wedd.*, URTICACEÆ.
Fibre ;
Chotra. *Hind.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Oil ;
Chotra, *Hind.*, Berberis Lycium, *Royle*, BERBERIDEÆ.
Gum ; Oil ;
Chouk, *Tam.*, Casuarina equisetifolia, *Forster*, CASUARINACEÆ.
Gum Tan ;
Chriman, *Tel.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Chuari, *Hind.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Gum ; Oil ;
Chukri, *Pb.*, *Afg.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;
Chulai, *Pb.*, Amarantus, *Sp.*?, AMARANTACEÆ.
Oil ;
Chur, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Chúri, *Nepal*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oil ;
Chuti, *Pb.*, *Afg.*, Rheum Emodi, *Wall.*, POLYGONACEÆ
Dye ;

Chuve, *Sans.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;
Chyad-potia, *Tel.*, Trichosanthes cucumerina, *Linn.*, CUCURBITACEÆ.
Gum ;
Cinnamon, *Eng.*, Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ; Oil ;
Cita, *Tel.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Fibre ;
Citron, *Eng.*, Citrus medica, *Linn.*, *var.* medica, RUTACEÆ.
Gum ; Tan ; Oil ;
Citrone, *Germ.*, Citrus medica, *Linn.*, *var.* Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;
Citronella, *Eng.*, Andropogon Nardus, *Linn.*, GRAMINEÆ.
Oil ;
Citronnier, *Fr.*, Citrus medica, *Linn.*, *var.* Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;
Climber, snake, *Eng.*, Bauhinia anguina, *Roxb.*, LEGUMINOSÆ.
Fibre ;
Cloves, *Eng.*, Caryophyllus aromaticus, *Linn.*, MYRTACEÆ.
Oil ;
Cochineal dye, *Eng.*, Coccus Cacti.
Dye ;
Cocoa plant, *Eng.*, Theobroma Cacao, *Linn.*, STERCULIACEÆ.
Oil ;
Cocoanut tree, *Eng.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Cocum, *Eng.*, Garcinia indica, *Chois*, GUTTIFERÆ.
Oil ;
Colza, *Eng.*, Brassica campestris, *Linn.*, CRUCIFERÆ.
Oil ;
Conda-pani, *Tam.*, Corypha umbraculifera, *Linn.*, PALMÆ.
Fibre ;
Conda-panna, *Tam.*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;
Cong, *Cingh.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Conghas, *Cingh.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Congo, *Tam.*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Connesi bark, *Eng.*, Holarrhena antidysenterica, *Wall.*, APOCYNEÆ.
Oil ;
Copal, Indian, *Eng.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;
Coral plant, *Eng.*, Jatropha nulifida, *Linn.*, EUPHORBIACEÆ.
Oil ;
Coral tree, Indian, *Eng.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Coriander, *Eng.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;
Cotton, *Eng.* *See* Gossypium arboreum, *Linn.*, MALVACEÆ.
Fibre Oil ;
Cotton, Dacca, Tanjore, *Eng.* *See* Gossypium herbaceum, *L.*, MALVACEÆ.
Fibre ;
Cotton, Sheraj, *Eng.* *See* Gossypium herbaceum, *L.*, *var.* herbaceum, MALVACEÆ. Fibre ;
Cotton tree, *Eng.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Oil ;
Cotton tree, white, *Eng.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Cowa, *Hind.*, Garcinia Cowa, *Roxb.*, GUTTIFERÆ.
Gum ; Dye ;

Coya, *Tel.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;

Cress, garden, *Eng.*, Lepidium sativum, *Linn.*, CRUCIFERÆ.
Oil ;

Crocodile Oil.
Oil ;

Croton, Purging, *Eng.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;

Cubeb, Pepper, *Eng.*, Piper Cubeba, *Linn.*, *f.*, PIPERACEÆ.
Oil ;

Cubebs, *Eng.*, *Fr.*, Piper Cubeba, *Linn.*, PIPERACEÆ.
Gum ;

Cucumber, *Eng.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;

Curri, *Nepal*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;

Cusunt, *Hind.*, Flemingia congesta, *Roxb.*, var nana, LEGUMINOSÆ.
Dye ;

Cutch, *Eng.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Cypress, Himalayan, *Eng.*, Cypressus torulosa, *Don.*, CONIFERÆ.
Gum ;

D

Dabdabbi, *Nepal*, Garuga pinnata, *Roxb.*, BURSERACEA.
Gum ; Tan ;

Dábriá, *Guz.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dabúr, *Beng.*, Cerbera Odollam, *Gaertn.*, APOCYNACEÆ.
Fibre ; Oil ;

Dadár, *Kumaun*, *Hazara*, *Kashmir*, *Garhwal*, Cedrus Deodara, *Loudon*
CONIFERÆ. Gum ; Oil ;

Dagdakti, *Mechi*, Macaranga indica, *Wight.*, EUPHORBIACEÆ.
Gum ;

Dahan, *Raj.*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;

Dahiri, *Nepal*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dahu, *Hind.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Dain, *Hind.*, Brassica campestris, *Linn.*, var. napus, CRUCIFERÆ.
Oil ;

Daira, *Hind.*, Wrightia tomentosa, *Röem* & *Scheult.*, APOCYNACEÆ.
Dye ;

Dajkar, *C.P.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;

Dakhani babul, *Hind.*, Pithecolobium dulce, *Benth.*, LEGUMINOSÆ.
Oil ;

Dakhmila, *N.-W. P.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;

Dala hurdi, *Paharia*, Morinda persicæfolia, *Ham.*, RUBIACEÆ.
Dye ;

Dalchíní, *Beng.*, Cinnamomum Tamala, *Nees.*, LAURINÆ.
Dye ; Oil ;

Dalim, *Kumaun*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dalimba, *Bom.*, *Mahr.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dalkaramcha, *Beng.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;

Dalmara, *Kan.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ;
Daluk, *Cingh.*, Euphorbia antiquorum, *Linn.*, EUPHORBIACEÆ.
Gum ;
Dámana, *Bom.*, Grewia tiliæfolia, *Vahl.*, TILIACEÆ.
Fibre ;
Dambil, *Garo*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;
Damiruga-mirattam, *Tam.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Dammar, *Eng.*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Dammar, *Eng.*, Dammara alba, *Rumph.*, CONIFERÆ.
Gum ;
Dammar, Black, *Eng.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;
Dammar, Rock, *Eng.*, Hopea odorata, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Dammar, White, *Eng.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;
Dampel, *Hind.*, Garcinia xanthochymus, *Hook.*, *f.*, GUTTIFERÆ.
Gum ;
Dam-ul-akhwain, *Hind.*, Calamus Draco, *Willd.*, PALMÆ.
Gum ;
Dan, *Burm.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Oil ;
Dandons, *Mahr.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Dandua, *Mark.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Dan-gywé, *Burm.*, Cassia Tora, *Linn.*, LEGUMINOSÆ.
Dye ;
Danimma-chettu, *Tel.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Dan-tha-lone, *Burm.*, Moringa pterygosperma, *Gaertn.*, MORINGACEÆ.
Gum ; Tan ; Fibre ; Oil ;
Dánti, *Mahr.*, Baliospermum montanum, *Mull-Arg.*, EUPHORBIACEÆ.
Oil ;
Danti, *Tel.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Dárahalada, (the stem of) Berberis aristala, *DC.*, BERBERIDEÆ.
Dye ;
Danyalu, *Tel.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;
Darakhte-kinnab, *Pers.*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre ; Oil ;
Darakhte-nar, *Pers.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Darchini, *Bom.*, Cinnamomum Tamala, *Nees.*, LAURAINÆ.
Dye ;
Dargu, *Tel.*, Ougenia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;
Darhalad, (the wood) *Bom.*, Berberis Lycium, *Royle*, BERBERIDEÆ.
Gum ;
Darhaldi, *Hind.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Darim, *Hind.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Dáruri, *Mahr.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ; Oil ;
Darshana, *Tel.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.

Darvi, *Sans.*, Coscinium fenestratum, *Colebr.*, MENISPERMACEÆ.
Dye ;

Dassi, *Ravi*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;

Daswaila, *N.-W. P.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;

Da[illegible]a, *Hind.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;

Dáurá, *Mahr.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Dye ;

Dawi, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dayshing, *Bhutia*, Daphne papyracea, *Wall.*, THYMELÆACEÆ.
Fibre ;

Debdári, *Hind.*, Polyalthia longifolia, *Benth. & Hook. f.*, ANONACEÆ.
Fibre ;

Debrelara, *Nepal*, Spatholobus Roxburghii, *Benth.*, LEGUMINOSÆ.
Gum ;

Dekamali, *Hind.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;

Deodar, *Eng.*, Cedrus Deodara, *London*, CONIFERÆ,
Gum ; Oil ;

Deodár, *Garhwal*, *Hazara*, *Kashmir*, *Kumaun*, Cedrus Deodara, *Loudon*,
CONIFERÆ. Gum ;

Deo kupas, *Mysore*, Gossypium arboreum, *L.*, MALVACEÆ.
Fibre ;

Dephal, *Beng.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Dera, *Beng.*, See Gossypium herbaceum, *L.*, var. herbaceum, MALVACEÆ,
Fibre ;

Der Saflor, *Ger.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ;

Devadaru, *Tel.*, Polyalthia longifolia, *Benth. & Hook. f.*,
ANONACEÆ. Fibre ;

Devadarū, *Tam.*, Erythroxylon monogynum, *Roxb.*, LINEÆ.
Oil ;

Devakanchana, *Bom.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Devi-diar, *Ravi*, Cupressus torulosa, *Don.*, CONIFERÆ.
Gum ;

Deya-danga, *Cingh.*, Dolichandrone Rheedii, *Seem.*, BIGNONIACEÆ.
Fibre ;

Dha, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dháaori, *Mahr.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dhák, *Hind.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ; Oil ;

Dhakur, *Beng.*, Cerbera Odollam, *Gaertn.*, APOCYNACEÆ.
Fibre ; Oil ;

Dhámin, *Hind.*, Grewia tiliæfolia, *Vahl.*, TILIACEÆ.
Fibre ;

Dhamman, *Pb.*, Grewia oppositifolia, *Roxb.*, TILIACEÆ.
Fibre ;

Dhamna, *Hind.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;

Dhamono, *Uriya*, Grewia tiliæfolia, *Vahl.*, TILIACEÆ,
Fibre ;

Dhana (seed), *Mahr.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ,
Oil ;

Dhaniā, *Beng.*, *Hind.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ,
Oil ;

Dhanicha, *Beng.*, Sesbania aculeata, *Pers.*, LEGUMINOSÆ.
Fibre ;

Dhannah. See Gossypium herbaceum, *L.* var. herbaceum, MALVACEÆ.
Fibre ;

Dhanyaka, *Sans.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;

Dharauli, *Hind.*, Wrightia tomentosa, *Röem.*, *&* *Scheult*, APOCYNEÆ.
Dye ;

Dhatte, *Gond.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Dhaula, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dhauli, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;

Dhaura, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dhaura, *Hind.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ;

Dháura, *Oudh*, Zizyphus rugosa, *Lamk.*, RHAMNEÆ.
Gum ; Dye ;

Dháuri, *Bom.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ;

Dháwa, *Hind.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dhayati, *Mahr.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Dye ;

Dhenras, *Beng.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;

Dhedumbara, *Mahr.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Fibre ;

Dhera, *Beng.*, Gossypium herbaceum, *Linn.*, var. herbaceum, MALVACEÆ.
Fibre ;

Dhewti, *Oudh*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Dhobein, *Hind.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;

Dhokri dau, *Raj.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dhondri, *Gondi*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Dhorara, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Dhuna, *Ass.*, Canarium bengalense, *Roxb.*, BURSERACEÆ.
Gum ;

Dhundhul, *Beng.*, Carapa moluccensis, *Lam.*, MELIACEÆ.
Gum ; Oil ;

Dhup, *N.-W. P.*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;

Dhup, *Bom.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;

Dhup, *Kan.*, Ailanthus malabarica, *DC.*, SIMARUBEÆ.
Gum ;

Dhúp, *Oudh*, *Nepal*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;

Dhupi, *Nepal*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;

Dhupinaram, *Tam.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Dhuvi, *C. P.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Diar, *Kashmir*, *Hazara*, *Garhwal*, *Kumaun*, Cedrus Deodara, *Loudon*, CONIFERÆ. Gum ; Oil ;

Diár, *Sind*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Didu, *Bnrm.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ;

Dikamali, *Hind.*, *Gus.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;

Dinduga, *Kan.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dingkain, *Khásia*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Oil ;

Dingsa, *Khásia*, Pinus kasya, *Royle*, CONIFERÆ.
Gum ; Tan ;

Dingsolir, *Khásia*, Myrica sapida, *Wall.*, MYRICACEÆ.
Tan ;

Dirasan, *Tel.*, Albizzia Lebbeck, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;

Diyapara, *Cingh.*, Wormia triquetra, *Rotte.*, DILLENIACEÆ.
Oil ;

Doda, *Sind.*, Nelumbium speciosum, *Willd.*, NYMPHÆACEÆ.
Fibre ;

Dodan, *Hind.*, Sapindus detergens, *Roxb.*, SAPINDACEÆ.
Gum ;

Dodan, *Hind.*, Sapindus Mukorossi, *Gaertn.*, SAPINDACEÆ.
Gum ; Oil ;

Dodder, *Eng.*, Cuscuta reflexa, *Roxb.*, CONVOLVULACEÆ.
Dye ;

Dohu, *Uriya*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;

Dolu, *Hind.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Dondhip, *Tel.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Doon, *Cingh.*, Doona zeylanica, *Thwaites*, DIPTEROCARPEÆ.
Gum ;

Doonkola, *Cingh.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;

Dopatti, *Ass.*, Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ;

Dorga-kaia, *Tel.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;

Dori, *Pb.*, Polygonum bistorta, *Linn.*, POLYGONACEÆ.
Oil ;

Dosray, *Tel.*, Cucumis Melo, *L.*, *forma* utilissimus (sp. *Roxb.*), CUCURBITACEÆ. Oil ;

Dowari, *Nepal*, Luculia gratissima, *Sweet*, RUBIACEÆ.
Dye ;

Drábchir, *Pb.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;

Drawi, *Pb.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Drek, *Hind.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;

Dú, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;

Duddi maddi, *Tel.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;

Dudhi, *Banda*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Gum ;

Dudhi, *Beng.*, Ichnocarpus frutescens, *R. Br.*, APOCYNACEÆ.
Fibre ;

Dudhi, *Hind.*, Wrightia tomentosa, *Röem & Scheult*, APOCYNACEÆ.
Dye ;

Dudhi, *Banda*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;
Dudhu-ki-lakri, *Hind.*, Holarrhena antidysenterica, *Wall.*, APOCYNACEÆ.
Oil ;
Dúdi-palla, *Tel.*, Dregea volubilis, *Benth.*, ASCLEPIADEÆ.
Fibre ;
Dudippi, *Tel.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;
Dudiyetta, *Tel.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Dudla, *Pb.*, Prunus Padus, *Linn.*, ROSACEÆ.
Gum ;
Dudla, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;
Dugarphort, *Sind*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ;
Dugong.
Oil ;
Dukak Kundar, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Dukh, *Arab.*, Balsamodendron Playfairii, *Hook.*, *f.*, BURSERACEÆ.
Gum ;
Dul-surkh, *Pers.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;
Dúm túli, *Pb.*, Adiantum Cappilus-Veneris, *Linn.*, FILICES
Oil ;
Dumba, *Cingh.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ;
Dumbur, *Beng*,, Ficus Cunia, *Buch.*, URTICACEÆ.
Fibre ;
Dúmni, *Chenab*, Jasminum officinale. *Linn.*, OLEACEÆ.
Oil ;
Dumshing, *Bhutia*, Abies Webbiana, *Lindl.*, CONIFERÆ.
Gum ;
Dún-dúl, *Beng.*, Luffa ægyptiaca, *Mill.* ex *Hook. f.*, CUCURBITACEÆ.
Oil ;
Dupadu, *Tel.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ; Oil ;
Dupa maram, *Kan.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;
Dúss, *Pb.*, Elsholtzia polystachya, *Benth.*, LABIATÆ.
Dye ;
Dwabote, *Burm.*, Kydia calycina., *Roxb.*, MALVACEÆ.
Fibre ;
Dyer's Oak, *Eng.*, Quercus infectoria, *Oliver*, CUPULIFERÆ.
Dye ;

E.

Eira-kati, *Tel.*, Pavonia odorata, *Willd.*, MALVACEÆ.
Fibre ;
Elandap-pazham, *Tam.*, Zizyphus Jujuba, *Lam.*, RHAMNEÆ.
Dye ; Tan ;
Elava maram, *Tam.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Gum ;
Elephant-creeper, *Eng.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oil ;
Elephant-grass, *Eng.*, Typha elephantina, *Roxb.*, TYPHACEÆ.
Fibre ;
Ellakay, *Tam.*, *Tel.*, Ellettaria Cardamomum, *Maton.*, SCITAMINEÆ.
Oil ;

Ellupi, *Mal.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ;
Elumich-cham-patham, *Tam.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Elupa, *Tam.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ;
Elupa, *Tam.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Elupay, *Tam.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Elupi, *Tam.*, Mimusops manilkara, *Don*, SAPOTACEÆ.
Gum ;
Erabadu-gaha, *Cingh.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Erand, Pahari, *Hind.*, *Beng.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;
Eranda, *Sans.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Eranda, Jangali, *Bom.*, Jatropha glandulifera, *Roxb.*, EUPHORBIACEÆ.
Dye ; Oil, ;
Erandi, *Mahr.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Tan ;
Erendi. *See* Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;
Erendi, *Sind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Erim-panna, *Tam.*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;
Erragandhapu-chekka, *Tel.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;
Erra-gem-kaya, *Tel.*, Hibiscus sabdariffa, *Linn.*, MALVACEÆ.
Fibre ;
Erra-jilgua, *Tel.*, Sesbania aculeata, *Pers.*, LEGUMINOSÆ.
Fibre ;
Erunkukri, *Sind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Eruvadi, *Tam.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSŒ.
Oil ;
Ervados, *Bom.*, Pimpinella Anisum, *Linn.*, UMBELLIFERÆ.
Oil ;
Esesh, *Bom.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Exile Oil, *Eng.*, Thevetia neriifolia, *Linn.*, APOCYNACEÆ.
Oil ;

F.

Fafra, *Tel.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye ;
Farad, *Hind.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Faranj-mushk, *Hind.* (seed of) Ocimum Basilicum, *Linn.* Var. pilosum, *Benth.*, LABIATÆ. Oil ;
Faras, *Pb.*, Tamarix articulata, *Vahl.*, TAMARISCINEÆ.
Gum ;
Farat, *Ass.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye ;
Farwa, *Pb.*, Tamarix articulata, *Vahl.*, TAMARISCINEÆ.
Gum ;
Fenjenghist, *Arab.*, Vitex Negundo, *Linn.*, VERBENACEÆ.
Dye ;

Fennel, Common, *Eng.*, Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;
Fennel, Eastern Giant, *Eng.*, Dorema Ammoniacum, *Don.*, UMBELLIFERÆ.
Oil ;
Fever Nut, *Eng.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Findák, *Pb.*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Fir, Silver, *Eng.*, Pinus sylvestris, *Linn.*, CONIFERÆ.
Fibre ;
Flax, Travancore, *Eng.*, Crotalaria juncea, *Linn.*, LEGUMINOSÆ.
Fibre ;
Flax, Linen, *Eng.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ;
Flax, New Zealand, *Eng.*, Phormium tenax, LILIACEÆ.
Fibre ;
Frankincense, *Eng.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;

G

Gab, *Beng.*, *Hind.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;
Gabdi, *Hind.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ; Oil ;
Gachodá, *And.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Gada-nelli, *Tel.*, Sponia orientalis, *Planch.*, URTICACEÆ.
Gum ;
Gadúmbal, *Pb.*, Rhus Wallichii, *Hook.*, *f.*, ANACARDIACEÆ.
Oil ;
Gaggaru, *Tel.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;
Gajaga, *Mahr.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Gájar, *Beng.*, *Hind.*, Daucus Carota, *Linn.*, UMBELLIFERÆ.
Oil ;
Gajjara gadda, *Tel.*, Daucus Carota, *Linn.*, UMBELLIFERÆ.
Oil ;
Gajjara kelangu, *Tam.*, Daucus Carota, *Linn.*, UMBELLIFERÆ.
Oil ;
Gajkai, *Kan.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Galgal, *Hind.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ; Oil ;
Galgoja, *Chenab*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Oil ;
Gall, *Eng.*, Quercus infectoria, *Oliver*, CUPULIFERÆ.
Dye ;
Gallu, *N. W. P.*, Taxus baccata, *Linn.*, CONIFERÆ,
Gum ; Dye ;
Galmendora, *Cingh.*, Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Galu, *Tel.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Gambier, *Eng.*, *Malay*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan. ;
Gamboge Tree, *Eng.*, Garcinia Morella, *Desrouss.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;
Ganaba, *Cingh.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Ganasúra, *Mahr.*, Croton oblongifolius, *Roxb.*, EUPHORBIACEÆ.
Oil ;

Gandahferozah, Boswellia serrata, *Roxb.*, var. serrata, BURSERACEÆ.
Gum ;

Gand-bábúl, *Hind.*, Acacia Farniciana, *Willd.*, LEGUMINOSÆ.
Dye ; Tan ;

Gande, *Nepal*, Daphne papyracea, *Wall.*, THYMELÆACEÆ.
Fibre ;

Gandere, *Kaner*, *Pb.*, Nerium odorum, *Soland*, APOCYNACEÆ.
Oil ;

Gandhabená, *Beng.*, Andropogon Schœnanthes, *Linn.*, GRAMINEÆ.
Oil ;

Gandhaki, *Pb.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;

Gandhal rince, *Bom.*, Andropogon citratus, *DC.*, GRAMINEÆ.
Oil ;

Gandhapu-chekk, *Tel.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Gándhaumbara, *Mahr.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Fibre ;

Gandi, *Pb.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;

Gandla, *Pb.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;

Gandumarugam-nettura, *Tel.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Ganeri, *Mahr.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;

Gangai, *Ass.*, Mallotus philippinensis, *Mül. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;

Gangal, *Hind.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;

Gangam, *Gond*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;

Gangan, *Burm.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Oil ;

Gangaraya, *Tel.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Gangichu, *Pb.*, Euphorbia neriifolia, *Linn.*, EUPHORBIACEÆ.
Gum ;

Ganguli, *N. W. P.*, Andropogon laniger, *Desf.*, GRAMINEÆ.
Fibre ;

Gangwa, *Beng.*, Excæcaria Agallocha, *Willd.*, EUPHORBIACEÆ.
Gum ;

Ganhira, *Pb.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Ganiár, *Hind.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;

Ganjá, *Hind.*, *Beng.*, *Bom.*, *Tam.*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre ; Oil ;

Ganjam, *Burm.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Dye ;

Ganjávi-chettu, *Tel.*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre :

Ganjika, *Sans.*, Cannabis sativa, *Linn,,* URTICACEÆ.
Fibre ;

Ganná, *Hind.*, *Beng.*, Saccharum officinarum, *Linn.*, GRAMINEÆ.
Fibre ;

Ganneru, *Tel.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Gantelu sajjalu, *Tel.*, Penicillaria spicata, *Willd.*, GRAMINEÆ.
Dye ;

Ganuga, *Tel.*, Pongamia glabra, *Vent.*, Leguminosæ.
Oil ;

Gaoshir, *Pers.*, Ferula Galbaniflua, *Boiss.*, Umbelliferæ.
Gum ;

Garan, *Beng.*, Ceriops Candolleana, *Arnott.*, Rhizophoreæ.
Tan ;

Garan, *Beng.*, Ceriops Roxburghiana, *Arnott.*, Rhizophoreæ.
Tan ;

Garanji, *Gond*, Pongamia glabra, *Vent.*, Leguminosæ.
Oil ;

Garbijaur, *Hind.*, Tetranthera lauriifolia, *Jacq.*, Laurineæ.
Oil ;

Gardal, *Bom.*, Entada scandens, *Benth.*, Leguminosæ.
Oil ;

Gardalu, *Pb.*, Prunus armeniaca, *Linn.*, Rosaceæ.
Gum ; Oil ;

Gardundi, *Kan.*, Ochrocarpus longifolius, *Benth & Hook. f.*, Guttiferæ.
Dye;

Gar-ga, *Tel.*, Garuga pinnata, *Roxb.*, Burseraceæ.
Gum ; Tan ;

Gari, *Tel.*, Badanites Roxburghii, *Planch.*, Simarubeæ.
Oil ;

Gari-kulay, *Beng.*, Glycine Soja, *Lieb.*, Leguminosæ.
Oil ;

Garinga, *Hind.*, Carissa Carandas, *Linn.*, Apocynaceæ.
Dye ; Tan ;

Garjan, *Beng.*, Dipterocarpus alatus, *Roxb.*, Dipterocarpeæ.
Gum ;

Garjan, *Beng.*, Dipterocarpus turbinatus, *Gaertn. f.*, Dipterocarpeæ.
Gum ;

Garjan-oil Tree, *Eng.*, Dipterocarpus turbinatus, *Gaertn. f.*, Dipterocarpeæ. Gum ;

Garlic, *Eng.*, Allium sativum, *Linn.*, Liliaceæ.
Oil ;

Garnikura, *Sans.*, Hibiscus cannabinus, *Linn.*, Malvaceæ.
Fibre ;

Garrah, *Gond*, Balanites Roxburghii, *Planch.*, Simarubeæ.
Oil ;

Garso, *Hind.*, Albizzia procera, *Benth.*, Leguminosæ.
Gum ; Tan ;

Garso, *Hind.*, Albizzia Lebbek, *Benth.*, Leguminosæ.
Gum ; Tan ;

Gartashiara, *Kumaun*, Villebrunea frutescens, *Blume.*, Urticaceæ.
Fibre ;

Garuga, *Tel.*, Garuga pinnata, *Roxb.*, Burseraceæ.
Gum ; Tan ;

Gasa-gasa-tol, *Tam.*, Papaver somniferum, *Linn.*, Papaveraceæ.
Oil ;

Gasa-gasa-tolu, *Tel.*, Papaver somniferum, *Linn.*, Papaveraceæ.
Oil ;

Gauli, *Hind.*, Briedelia retusa, *Spreng.*, Euphorbiaceæ.
Tan ;

Gausam, *Hind.*, Schleichera trijuga, *Willd.*, Sapindaceæ.
Oil ;

Gauzaban, *Hind.*, Onosma echioides, *Linn*, Boragineæ.
Dye ;

Gavuldu, *Mysore*, Careya arborea, *Roxb.*, Myrtaceæ.
Gum ;

Gaz-anjabin, *Arab.*, Tamarix dioica, *Roxb.*, Tamariscineæ.
Gum ; Dye ; Tan ;

Gech-chakkay, *Tam.*, Cæsalpinia Bonducella, *Roxb.*, Leguminosæ.
Oil ;

Geia, *Hind.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;

Geio, *Nepal*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;

Geio, *Nepal*, Briedelia montana, *Willd*, EUPHORBIACEÆ.
Tan ;

Gelaphala, *Mahr.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Geli, *N. W. P.*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;

Genda, *Hind.*, *Beng.*, Tagetes patula, *Linn.*, COMPOSITÆ.
Dye ;

Gendeli poma, *Ass.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Gendia, *Beng.*, Tagetes patula, *Linn.*, COMPOSITÆ.
Dye ;

Geor, *Beng.*, Excæcaria Agallocha, *Willd.*, EUPHORBIACEÆ.
Gum ;

Geredi, *Uriya*, Entada scandens, *Benth.*, LEGUMINOSÆ.
Oil ;

Geria, *Beng.*, Excæcaria Agallocha, *Willd.*, EUPHORBIACEÆ.
Gum ;

Geri-máti, *Beng.*, Ochre.

Ghafiz, *Pb.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.

Ghariam, *Ass.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;

Ghátipittapápada, *Bom.*, Peristrophe tinctoria, *Nees.*, ACANTHACEÆ.
Dye ;

Ghatiya, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;

Ghazlei, *Pb.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, T. gallica, *Linn.*,
TAMARISCINEÆ. Gum ; Dye ; Tan ;

Ghee.
Oil ;

Ghikumári, *Hind.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;

Ghila, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;

Ghirgilly Oil from Kanara.
Oil ;

Ghirta-kumári, *Beng.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;

Ghogar, *Hind.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Ghonasaphan, *Mahr.*, Sanseviera zeylanica, *Willd.*, HÆMODORACEÆ.
Fibre ;

Ghont, *Hind.*, Zizyphus xylopyra, *Willd.*, RHAMNEÆ.
Tan ;

Ghoran, *Beng.*, Ceriops Roxburghiana, *Arnott.*, RHIZOPHOREÆ.
Tan ;

Ghora nim, *Beng.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;

Ghor-rai, *Hind.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Ghosali, *Bom.*, Luffa ægyptiaca, *Mill.*, *ex Hook. f.*, CUCURBITACEÆ.
Oil ;

Ghritakumari, *Sans.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;

Ghwareshtái, *Afg.*, Prunus persica, *Benth. Hook. f.*, ROSACEÆ.
Gum ; Oil ;

Gia, *Mechi*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Giam, *Tibet*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Gum ; Oil ;
Gidhro, *Sind*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;
Gidúri, *Sind.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Gilas., *Pb.*, Prunus Cerasus, *Linn.*, ROSACEÆ.
Gum ;
Gilead, Balm of, *Eng.*, Balsamodendron Opabalsamum, *Kunth*, BURSERACEÆ. Gum ;
Gilla, *Beng.*, Entada scandens, *Benth.*, LEGUMINOSÆ.
Oil ;
Ging, *Eng.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Gingan, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Gingeliy, *Eng.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Ginger grass,
Oil ;
Gira, *Afg.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan ; Fibre ;
Girdu, *Pers.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ;
Girdugan, *Pers.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ;
Girya, *C. P.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;
Giur, *Kashmir*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Gobia, *Nepal*, Cephalostachium capitatum, *Munro*, GRAMINEÆ.
Fibre ;
Gobli, *Kan.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Tan ;
Gobria sulah, *Nepal*, Abies Webbiana, *Lindl.*, CONIFERÆ.
Gum ;
Gogu, *Tel.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Gogul dhup, *Nepal*, Canarium bengalense, *Roxb.*, BURSERACEÆ.
Gum ;
Gokatu, *Cingh.*, Garcinia Morella, *Desrouss.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;
Golab, *Hind.*, *Beng.*, *Pb.*, Rosa alba, *Linn.*, ROSACEÆ.
Oil :
Goladára, *Mahr.*, Sterculia guttata, *W. & A.*, STERCULIACEÆ.
Fibre ;
Goldia, *Raj.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Golka, *Kumaun*, Bœhmeria macrophylla, *Don.*, URTICACEÆ.
Fibre ;
Gol kamela, *Pb.*, Phyllanthus nepalensis, *Müll. Arg.*, EUPHORBIACEÆ.
Fibre ;
Gol kaddú, *Pb.*, Benincasa cerifera, *Savi*, CUCURBITACEÆ.
Oil ;
Gol-kaddue, *Hind.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Golpatta, *Beng.*, Phœnix paludosa, *Roxb.*, PALMÆ.
Fibre ;
Gólra, *Raj.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Gombo, *Fr.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;

Gondani, *Mahr.*, Cordia Rothii, *Rœm.* & *Sch.*, Boragineæ.
Gum ;

Gondi, *Hind.*, Cordia Rothii, *Röem.* & *Sch.*, Boragineæ.
Gum ;

Gondi, *Hind.*, Cordia Myxa, *Linn.*, Boragineæ.
Dye ; Fibre ;

Gondni, *Hind.*, Cordia Rothii, *Röem.* & *Sch.*, Boragineæ.
Gum ;

Gongkura, *Tel.*, Hibiscus cannabinus, *Linn.*, Malvaceæ.
Oil ;

Gongo, *Uriya*, Nyctanthes Arbor-tristis, *Linn.*, Oleaceæ.
Dye ;

Gon nyin, *Burm.*, Entada scandens, *Benth.*, Leguminosæ.
Oil ;

Gopi, *Nepal*, Cephalostachium capitatum, *Munro*, Gramineæ.
Fibre ;

Goran, *Beng.*, Ceriops Candolleana, *Arnott.*, Rhizophoreæ
Tan ;

Goranta, *Kan.*, *Tel.*, Lawsonia alba, *Lam.*, Lythraceæ.
Dye ; Oil ;

Goren, *Burm.*, Bœhmeria nivea, *H. & A.*, Urticaceæ.
Fibre ;

Gori nim, *Bom.*, Melia Azedarach, *Linn.*, Meliaceæ.
Oil ;

Gorkatri, *Kashmir*, Indigofera atropurpurea, *Ham.*, Leguminosæ.
Fibre ;

Gorklu, *Kan.*, Sponia orientalis, *Planch.*, Urticaceæ.
Gum ;

Gota gamba, *Hind.*, Garcinia Morella, *Desrouss*, Guttiferæ.
Gum ; Tan ; Oil ;

Goti, *Hind.*, Zizyphus xylopyra, *Willd.*, Rhamneæ.
Tan ;

Goti, *Tel.*, Zizyphus xylopyra, *Willd.*, Rhamneæ.
Tan ;

Goukura, *Tel.*, Hibiscus cannabinus, *Linn.*, Malvaceæ.
Fibre ;

Gourd, *Eng.*, Cucurbita maxima, *Duchesne*, Cucurbitaceæ.
Oil ;

Gourd, Bottle, *Eng.*, Lagenaria vulgaris, *DC.*, Cucurbitaceæ.
Oil ;

Gourd nut.
Oil ;

Gourd, White, *Eng.*, Cucurbita Pepo, *DC.*, Cucurbitaceæ.
Oil ;

Gram, Common, *Eng.*, Cicer arietinum, *Linn.*, Leguminosæ.
Dye ;

Granades, *Fr.*, Punica Granatum, *Linn.*, Lythraceæ.
Gum ; Dye ; Tan ;

Granats, *Ger.*, Punica Granatum, *Linn.*, Lythraceæ.
Gum ; Dye ; Tan ;

Granthiparni, *Sans.*, Artemisia vulgaris, *Linn.*, Compositæ.
Oil ;

Grass, China, *Eng.*, Bœhmeria nivea, *H. & A.*, Urticaceæ.
Fibre ;

Grass, Geranium, *Eng.*, Andropogon Schœnanthes, *Linn.*, Gramineæ.
Oil ;

Grass, Lemon, *Eng.*, Andropogon citratus, *DC.*, Gramineæ.
Oil ;

Grass-mats, *Eng.*, Cyperus tegetum, *Roxb.*, Gramineæ.
Fibre ;

Grass, Munj, *Eng.*, Saccharum Munja, *Roxb.*, Gramineæ.
Fibre ;

Grass, Rhea, *Eng.*, Bœhmeria nivea, *H. & A.*, URTICACEÆ.
Fibre ;
Grass, Roussa, *Eng.*, Andropogon Nardus, *Linn.*, GRAMINEÆ.
Fibre ;
Ground Nut, *Eng.*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oil ;
Guá, *Beng.*, Areca Catechu, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Guábáblá, *Bom.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Dye ; Tan ;
Guava, *Eng.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Gubadarra, *Tel.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;
Gubák, *Sans.*, Areca Catechu, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Gudúríchákánda, *Bom.*, Costus speciosus, *Sm.*, SCITAMINEÆ.
Oil ;
Gugal, *Bom.*, Balsamodendron Roxburghii, *Arn.*, BURSERACEÆ.
Gum ;
Gugal, *Tel.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;
Gugala, *Beng.*, Balsamodendron Roxburghii, *Arn.*, BURSERACEÆ.
Gum ; Oil ;
Gugal Gum., *Eng.*, (also Sind name of plant), Balsamodendron Mukul, *Hook.*, BURSERACEÆ. Gum ;
Guggal, *N. W. P.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;
Guggul, *Beng.*, Balsamodendron Mukul, *Hook.*, BURSERACEÆ.
Gum ;
Guggulu, *Tam.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Gugil, *Tel.*, Boswellia serrata, *Roxb.*, var. Glabra, BURSERACEÆ.
Gum ;
Gugul, *Hind.*, Balsamodendron Mukul, *Hook.*, BURSERACEÆ.
Gum ;
Gúgúlápívchettu, *Tel.*, Boswellia serrata, *Roxb.*, var. Glabra, BURSERACEÆ.
Gum ;
Guguli, *Beng.*, *Hind.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oil ;
Guhu, *Hind.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Gu-kikar, *Hind.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Gul, *Bom.*, Rosa alba, *Linn.*, ROSACEÆ.
Oil ;
Gulal-tulsi, *Beng.*, *Hind.*, Ocimum Basilicum, *Linn.*, Var. glabratum, *Benth.*, LABIATEÆ. Oil ;
Gular, *Hind.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Gul-bola, *Pb.*, Sterculia villosa, *Roxb.*, STERCULIACEÆ.
Gum ;
Gul-i-ajaib, *Hind.*, Hibiscus mutabilis, *Roxb.*, MALVACEÆ.
Fibre ;
Gul-i-pista, *Hind.*, Pistacia vera, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;
Guljalil, *Bom.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ.
Dye ;
Gulkáiro, *Hind.*, *Bom.*, Althæa rosea, *Linn.*, MALVACEÆ.
Dye ;
Gulla, *Simla*, Cupressus torulosa, *Don.*, CONIFERÆ.
Gum ;

Gul shab bo, *Pb.*, Polyanthes tuberosa, *Linn.*, POLYGONACEÆ.
Oil ;
Gumbengfong, *Mechi*, Plecospermum spinosum, *Trecul.*, URTICACEÆ.
Dye ;
Gum, Blue, *Eng.*, Eucalyptus globulus, *Lab.*, MYRTACEÆ.
Oil ;
Gummaddikaia, *Tel.*, Cucurbita maxima, *Duchesne*, CUCURBITACEÆ.
Oil ;
Gummar, *Gond*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;
Gumpini, *Tel.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Gunda-bhaduli, *Beng.*, Pæderia fœtida, *Linn.*, RUBIACEÆ.
Fibre ;
Gunda-birzoand ? *Hind.*, Boswellia serrata, *Roxb.*, BURSERACEÆ.
Gum ;
Gunda-gilla, *Beng.*, Bauhinia macrostachya, *Wall.*, LEGUMINOSÆ.
Gundali, *Hind.*, Pæderia fœtida, *Linn.*, RUBIACEÆ.
Fibre ;
Gundra, *Tel.*, *Sans.*, Saccharum Mara, *Roxb.*, GRAMINEÆ.
Fibre ;
Gung, *Magh.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Gunglay, *Mahr.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;
Gungu, *Tel.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ; Oil ;
Gurapu-badam, *Tel.*, Sterculia fœtida, *Linn.*, STERCULIACEÆ.
Oil ;
Gurar, *Hind.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Gurbári, *Hind.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Guria, *Beng.*, Kandelia Rheedii, *W. & A.*, RHIZOPHOREÆ.
Dye ; Mordant ;
Gurial, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Gurinda, *Hind*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;
Gurjun, *Beng.*, Dipterocarpus turbinatus, *Gaertn.*, *f.*, DIPTEROCARPEÆ.
Gum ; Oil ;
Gurkur, *Hind.*, Al bizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;Tan ;
Gurmala, *Guz.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Gurosatumi, *Tel.*, Leucas cephalotes, *Spreng.*, LABIATÆ.
Dye ; Oil ;
Gutta-percha, *Eng.*, Dichopsis Gutta, *Bth. & Hook. f.*, SAPOTACEÆ.
Gum ; Oil ;
Guyá bábulá, *Beng.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ;
Gwa, *Hind.*, Tetranthera monopelata, *Roxb.*, LAURINEÆ.
Oil ;
Gwa, *Pb.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Gwedauk, *Burm.*, Connarus speciosus, *McLell.*, CONNARACEÆ.
Oil ;
Gwéy, *Burm.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Gwayral, *Hind.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;

Gyo, *Burm.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;

Gyootnway, *Burm.*, Gnetum scandens, *Roxb.*, GNETACEÆ.
Fibre ;

H

Haba, *Bom.*, Marsdenia Roylei, *Wight*, ASCLEPIADEÆ.
Fibre ;

Hab-ul-ás, *Pb.*, Myrtus communis, *Linn.*, MYRTACEÆ,
Oil ;

Hab-ul-kalb, *Arab.*, Semecarpus Anacardium, *Linn.*, *f.*, ANACARDIACEÆ,
Gum ; Dye ; Oil ;

Hádavarná, *Bom.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Haddú, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;

Hakuch, *Beng.*, Psorelea corylifolia, *Linn.*, LEGUMINOSÆ.
Oil ;

Hakún, *Hind.*, Baliospermum montanum, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Hal, *Cingh.*, Valeria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Haldi, *Hind.*, Curcuma longa, *Roxb.*, SCITAMINEÆ.
Dye ;

Haldi-algusi-luta, *Beng.*, Cuscuta reflexa, *Roxb.*, CONVOLVULACEÆ.
Dye ;

Haldi, Ban, *Hind, N.-W. P.*, Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;

Haldi-gach, *Beng.*, Coscinium fenestratum, *Colebr.*, MENISPERMACEÆ.
Dye ;

Haldi, Jangli, *Hind.*, *N.-W. P.*, Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;

Haleem, *Dec.*, Lepidium sativum, *Linn.*, CRUCIFERÆ.
Oil ;

Haleo, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;

Hari, *Dec.*, Terminalia Chebula, *Retz.*, COMBRETACEÆ,
Gum ; Dye ; ; Tan ; Oil ;

Halu, *Pb.*, Impatiens Edgeworthii, *Hook.*, GERANIACEÆ,
Oil ;

Halud, *Beng.*, Curcuma longa, *Roxb.*, SCITAMINEÆ.
Dye ;

Halud, Ban, *Beng.*, Curcuma aromatica, *Salisb.*, SCITIMINEÆ,
Dye ;

Hamra, *Guz.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Hanjal, *Uriya*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Hár, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;

Har, *Hind.*, Terminalia Chebula, *Retz.*, COMBRETACEÆ,
Gum ; Dye ; Tan Oil ;

Harabará, *Mahr.*, Cicer arientinum, *Linn.*, LEGUMINOSÆ.
Dye ;

Harara, *Hind.*, Terminalia Chebula, *Retz.*, COMBRETACEÆ,
Gum ; Dye ; Tan ; Oil ;

Hardwari peori, *Pb.*, Peori Dye.
Dye ;

Hargharka, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ,
Dye ;

Hari, *Pb.*, Prunus armeniaca, *Linn.*, Rosaceæ.
Gum ; Oil ;
Haridrá, *Sans.*, Curcuma longa, *Roxb.*, Scitamineæ.
Dye ;
Haridrá, Ban, *Sans.*, Curcuma aromatica, *Salisb.*, Scitamineæ.
Dye ;
Harin harra, *Hind.*, Amoora Rohituka, *W. & A.*, Meliaceæ.
Oil ;
Harin khana, *Hind.*, Amoora Rohituka, *W. & A.*, Meliaceæ.
Oil ;
Haritaki, *Beng.*, Terminalia Chebula, *Rets.*, Combretaceæ.
Gum ; Dye ; Tan ; Oil ;
Haritaki, *Beng.*, Terminalia citrina, *Roxb.*, Combretaceæ.
Dye ;
Harku, *Pb.*, Rhus Wallichii, *Hook. f.*, Anacardiaceæ.
Oil ;
Harla, *Dec.*, Terminalia Chebula, *Rets.*, Combretaceæ.
Gum ; Dye ; Tan ;
Harnauli, *Salt Range*, Ricinus communis, *Linn.*, Euphorbiaceæ.
Mordant ; Oil ;
Harra, *Hind.*, Terminalia Chebula, *Rets.*, Combretaceæ.
Gum ; Dye ; Tan ; Oil ;
Harrari, *Nepal*, Acacia Intsia, *Willd.*, Leguminosæ.
Dye ;
Harri, *Hind.*, Murraya Kœnigii, *Spr.*, Rutaceæ.
Oil ;
Harro, *Gond*, Terminalia Chebula, *Rets.*, Combretaceæ.
Gum ; Dye ; Tan ;
Harsihár, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, Oleaceæ.
Oil ;
Harsingahar, *Hind.*, *Beng.*, *Bom.*, Nyctanthes Arbor-tristis, *Linn.* Oleaceæ. Dye ; Oil ;
Harvinghar, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, Oleaceæ.
Oil ;
Harwar, *Tel.*, Acacia leucophlœa, *Willd.*, Leguminosæ.
Dye ;
Hathikhatyan, *Dec.*, Adansonia digitata, *Linn.*, Malvaceæ.
Fibre ;
Hatian, *Hind.*, Eriodendron anfractuosum, *DC.*, Malvaceæ.
Gum ;
Hawar, *Oudh*, Dolichandrone falcata, *Seem.*, Bignoniaceæ.
Fibre ;
Hayamarak, *Sans.*, Wrightia tinctoria, *R. Br.*, Apocynaceæ.
Dye ;
Hazel Nut (Indian), *Eng.*, Corylus Colurna, *Linn.*, Cupuliferæ.
Oil ;
Hebalsu, *Mahr.*, *Kan.*, Artocarpus hirsuta, *Lamk.*, Urticaceæ.
Gum ;
Heboo, *Burm.*, Carthamus tinctorius, *Linn.*, Compositæ.
Dye ;
Heela, *Burghers*, Garcinia Cambogia, *Desrouss.*, Guttiferæ.
Gum ; Dye ;
Hemlock spruce (Indian), *Eng.*, Abies dumosa, *Loudon*, Coniferæ.
Gum ;
Hemp, *Eng.*, Cannabis sativa, *Linn.*, Urticaceæ.
Fibre ;
Hemp, Bow-string, (fibre of) Calotropis gigantea, *R. Br.*, Asclepiadeæ.
Fibre ;
Hemp, Bow-string, *Eng.*, Sanseviera zeylanica, *Willd.*, Liliaceæ.
Fibre ;
Hemp, Sun, Indian., Brown, Bombay, Jubbulpore, *Eng.*, Crotalaria juncea, *Linn.*, Leguminosæ. Fibre ;

Hemp, Deccani, *Eng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Hemp, Manilla, *Eng.*, Musa textilis, *Louis.*, *Nees.*, MUSACEÆ.
Fibre ;
Hendl, *Ass.*, Barringtonia acutangula, *Gaertn* , MYRTACEÆ.
Tan ;
Hengra, *Bomb.*, Ferula Narthex, *Boiss.*, UMBELLIFERÆ.
Gum ;
Henna, *Eng.*, *Hind.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Herbadoce, *Portuguese*, Pimpinella Anisum, *Linn.*, UMBELLIFERÆ.
Oil ;
Herpa, *Hind.*, Girardinia heterophylla, *Decaisne.*, URTICACEÆ.
Fibre ;
Heru, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Hesswa, *Kan.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ
Gum ;
Hewar, *Mahr.*, Acacia leucophlœa , *Willd.*, LEGUMINOSÆ.
Dye ;
Hibiscus, Edible, *Eng.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;
Hibiscus, Hemp-leaved, *Eng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Hibiscus, Changeable, *Eng.*, Hibiscus mutabilis, *Roxb.*, MALVACEÆ.
Fibre ;
Hijál, *Beng.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ
Tan ;
Hijili badam, *Beng.*, *Bom.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ. Gum ; Tan ;
Hijuli, *Beng.*, Anacardium occidentale, *Linn* , ANACARDIACEÆ.
Oil ;
Hilika, *Ass.*, Terminalia citrina, *Roxb.*, COMBRETACEÆ.
Dye ;
Hilikha, *Ass* , Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Gun ; Dye ; Tan ; Oil ;
Hims, *Arab.*, Cicer arietenum., *Linn.*, LEGUMINOSÆ.
Dye ;
Hing, *Bomb*, *Hind.*, Ferula alliacea, *Boiss.*, UMBELLIFERÆ.
Gum ;
Hing, *Beng.*, *Hind.*, Ferula Narthex, *Boiss.*, UMBELLIFERÆ.
Oil ;
Hingan, *Mahr.*, Balanites Roxburghii, *Planch.*, SIMARUBEÆ.
Oils ;
Hingol, *Hind.*, Balanitus Roxburghii, *Planch.*, SIMARUBEÆ.
Oils ;
Hingota, *Hind.*, Balanites Roxburghii, *Planch.*, SIMARUBEÆ.
Oil ;
Hingu, *Sans* , Ferula alliacea, *Boiss.*, UMBELLIFERÆ.
Gum ;
Hingu, *Hind.*, Balanites Roxburghii, *Planch.*, SIMARUBEÆ.
Oil ;
Hingu, *Sans.*, Ferula Narthex, *Boiss.*, UMBELLIFERÆ.
Oil ;
Hintal, *Beng.*, Phœnix paludosa, *Roxb.*, PALMÆ.
Fibre ;
Hippe, *Kan.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ;
Hirabol, *Hind.*, Balsamodendron Myrrha, *Nees.*, BURSERACEÆ .
Gum ;
Hiradá, *Mahr.*, Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Hiradakhana, *Mahr.*, Calamus Draco, *Willd.*, PALMÆ.
Gum ;
Hirada khum, *Hind.*, Calamus Draco, *Willd.*, PALMÆ.
Gum ;
Hirakosh, *Hind.*, *Beng.*, Proto-Sulphate of Iron.
Dye ;
Hirandodi, *Mahr.*, Dregea volubilis, *Benth.*, ASCLEPIADEÆ.
Fibre ;
Hital, *Beng.*, Phœnix paludosa, *Roxb.*, PALMÆ.
Fibre ;
Hlo-sa-klot-kunj, *Lepcha*, Prunus Padus, *Linn.*, ROSACEÆ.
Gum ;
Hlosiri, *Lepcha*, Quercus pachyphilla, *Kurz.*, CUPULIFERÆ.
Dye ; Tan ;
Hman, *Burm.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;
Hmya-seik, *Burm.*, Antiaris toxicaria, *Leech.*, URTICACEÆ.
Gum ;
Hnan, *Burm.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Hnanlongyaing, *Burm.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Tan ;
Hogla, *Beng.*, Typha Elephantina, *Roxb.*, TYPHACEÆ.
Fibre ;
Hog Plum, *Eng.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ. Gum ;
Hog, Sea, *See* **Dugong Oil.**
Oil ;
Holly-hock, *Eng.*, Althœa rosea, *Linn.*, MALVACEÆ.
Dye ;
Holly-leaved Oak, *Eng.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Holm Oak, *Eng.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Hom, *Phekial*, Strobilanthes flaccidifolius, *Nees.*, ACANTHACEÆ.
Dye ;
Honge, *Kan.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Honi, *Bom.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Hoom, *Bom.*, Saccopetalum tomentosum, *Hook. f.*, ANONACEÆ.
Gum ;
Horá, *Cingh.*, Dipterocarpus zeylanicus, *Thwaites*, DIPTEROCARPEÆ.
Oil ;
Horse-radish Tree, *Eng.*, Moringa pterygosperma, *Gaertn*, MORINGEÆ.
Gum ; Tan ; Fibre ;
Hortaki, *Cachar*, Terminalia citrina, *Roxb.*, COMBRETACEÆ.
Dye ;
Horu-surat, *Ass.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Hotai, *Solami*, Balsamodendron Playfairii, *Hook. f.*, BURSERACEÆ.
Gum ;
Hpalan, *Burm.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Hpet-woona, *Burm.*, Berrya Ammonilla., *Roxb.*, TILIACEÆ.
Fibre ;
Hub-ul-mushk, *Arab.*, Hibiscus Abelmoschus., *Linn*, MALVACEÆ.
Fibre ;
Huile-de-Castor, *Fr.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Huile-de-Sesame, *Fr.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;

Hujed, *Arab.*, Adansonia digitata, *Linn.*, MALVACEÆ.
Fibre ;
Hukmchil, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ;
Hulashing, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;
Huldi kung, *Hind.*, *Beng.*, Morinda citrifolia, *Linn.*, var. bracteata, RUBIACEÆ. Dye ;
Huldi kung, *Lepcha*, Morinda persicæfolia, *Ham.*, RUBIACEÆ.
Dye ;
Hul-khusa, Bura., *Beng.*, Leucus cephulotes, *Spreng*, LABIATÆ.
Dye ; Oil ;
Hulluch, *Ass.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Hungai, *Hind.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Huragalu, *Mysore*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;
Hurdi, *Hind.*, *Beng.*, Morinda citrifolia, *Linn.*, var. bracteata, RUBIACEÆ.
Dye ;
Hurhuria, *Beng.*, Cleome viscosa, *Linn.*, CAPPARIDEÆ.
Oil ;
Hurmala, *Bom.*, Piganum Harmala, *Linn.*, RUTACEÆ.
Dye ;

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Ichal, *Kan.*, Phœnix farinefera, *Willd.*, PALMÆ.
Fibre ;
Ichal, *Kan.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Fibre ;
Ijál, *Hind.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;
Iláchi, *Beng.*, *Hind.*, Amomum subulatum, *Roxb.*, SCITAMINEÆ.
Ilang-ilang, *Eng.*, *Mal.*, Cananga odorata, *H. f. & T.*, ANONACEÆ.
Oil ;
Illavam, *Tam.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Illavam, *Tam.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Illipi butter, *see* **Bassia latifolia**, *Roxb.*, SAPOTACEÆ.
Oil ;
Illupi, *Tam.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Imbul, *Cingh.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Imburel, *Tam.*, Oldenlandia umbellata, *Linn.*, RUBIACEÆ.
Dye ;
Imli, *Hind.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
In, *Burm.*, Dipterocarpus tuberculatus, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Ind, *Hind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Inderjau, *Hind.*, Holarrhena antidysenterica, *Wall.*, APOCYNACEÆ.
Oil ;
India-rubber, *Eng.*, Ficus elastica, *Bl.*, URTICACEÆ.
Gum ;
Indigo, *Eng.*, Indigofera tinctoria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;

Indigo, Ceylon, *Eng.*, Tephrosia tinctoria, *Pers.*, Leguminosæ.
Dye ; Oil ;
Indraphal, *Mahr.*, Citrullus colocynthis, *Schrad.*, Cucurbitaceæ.
Oil ;
Indrawan, *Dec.*, Citrullus Colocynthis, *Schrad.*, Cucurbitaceæ.
Oil ;
Indrayan, *Hind.*, *Mahr.*, Citrullus Colocynthis, *Schrad.*, Cucurbitaceæ.
Oil ;
Ingua, *Hind.*, Balanites Roxburghii, *Planch.*, Simarubeæ.
Oil ;
Inguva, *Tel.*, Ferula narthex, *Boiss.*, Umbelliferæ.
Oil ;
Ingyin, *Burm.*, Shorea Siamensis, *Miq.*, Dipterocarpeæ.
Gum ;
Ippa, *Tel.*, Mimusops manilkara, *Don.*, Sapotaceæ.
Gum ;
Ippi, *Tel.*, Bassia longifolia, *Willd.*, Sapotaceæ.
Gum ; Dye ; Tan ; Oil ;
Irak, *Arab.*, Salvadora persica, *Linn.*, Salvadoraceæ.
Oil ;
Irapu, *Tam.*, Cynometra ramiflora, *Linn.*, Leguminosæ.
Dye ; Oil ;
Iripa, *Mal.*, Cynometra cauliflora, *Linn.*, Leguminosæ.
Oil ;
Iris, *Eng.*, Iris florentina, *Linn.*, Iridaceæ.
Oil ;
Iron-wood Tree, *Eng.*, Xylia dolabriformis, *Benth.*, Leguminosæ.
Gum ; Oil ;
Iroopoo, *Kan.*, Cynometra ramiflora, *Linn.*, Leguminosæ.
Dye ; Oil ;
Irrip, *Gond.*, Bassia latifolia, *Roxb.*, Sapotaceæ.
Gum ; Dye ; Tan ;
Irul, *Tam.*, Xylia dolabriformis, *Benth.*, Leguminosæ.
Gum ; Oil ;
Irúp, *Gond*, Bassia latifolia, *Roxb.*, Sapotaceæ.
Gum ; Dye ; Tan ; Oil ;
Isband Lahouri, *Pb.*, (seeds of) Peganum Harmala, *Linn.*, Rutaceæ.
Dye ; Oil ;
Iser, *Kashmir*, Prunus armeniaca, *Linn.*, Rosaceæ.
Oil ;
Iskabena, *Pers.*, Sagabenum.
Gum ;
Ispanaj, *Arab.*, Spinacia oleracea, *Mill.*, Chenopodiaceæ.
Oil ;
Ispanda, *Bom.*, Peganum Harmala, *Linn.*, Rutaceæ.
Dye ;
Itah, *Godavari*, Helicteres Isora, *Linn.*, Sterculiaceæ.
Fibre ;

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Jack-fruit Tree, *Eng.*, Artocarpus integrifolia, *Linn.*, Urticaceæ.
Gum ; Dye ; Fibre ;
Jack Tree, Wild, *Eng.*, Artocarpus hirsuta, *Lamk.*, Urticaceæ.
Gum ;
Jadi, *Kan.*, Tectona grandis, *Linn.*, Verbenaceæ.
Gum ; Dye ;
Jadical, *Tam.*, Myristica moschata, *Willd.*, Myristiceæ.
Oil ;
Jaephal, *Hind.*, Myristica moschata, *Willd.*, Myristiceæ.
Oil ;

Jáfrán, *Beng.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;
Jaggarwah, *C. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Jahi, *Kumaun*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;
Jai, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Jaia-phula, *Beng.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;
Jaida rumi, *Hind.*, Calamus Draco, *Willd*, PALMÆ.
Gum ;
Jaipal (Nutmeg). *Hind.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;
Jaipatri, *Bom.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;
Jaiphal-jari, *Garhwal*, Memorialis pentandra, *Wedd.*, URTICACEÆ.
Fibre ;
Jait, *Hind.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;
Jajikaia, *Tel.*, Myristica moschata, *Wall.*, MYRISTICEÆ.
Oil ;
Jal, *Pb.*, Salvadora Oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;
Jalghoza, *Afg.*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Oil ;
Jali, *Kan.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ;
Jallaur, *Hind.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Fibre ;
Jallur, *Hind.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Jam, *Beng.*, Eugenia Jambolana, *Lam*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Jama, *Tel.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Jamalagota, *Mahr.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;
Jamalgota, *Hind.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;
Jáman, *Hind.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Jamba, *Mahr.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Oil ;
Jambe, *Kan.*, Xylia dolabriformis, *Benth*, LEGUMINOSÆ.
Gum ;
Jambira, *Sans.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;
Jambu, *Hind.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Gum ; Oil ;
Jamne-munda, *Nepal.*, Berberis nepalensis, *Spreng.*, BERBERIDEÆ.
Dye ;
Jamoon, *Hind.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Jamu, *Ass.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Ján, *Pb.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Jangama, *Bom.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;
Jangi, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;

Jangali-ananas, *Bom.*, Agave americana, *Linn.*, AMARYLLIDÆ.
Fibre ;

Jangalibadam, *Mahr.*, Sterculia fœtida, *Linn.*, STERCULIACEÆ.
Oil ;

Jangla badam, *Hind.*, Canarium commune, *Linn.*, BURSERACEÆ.
Gum ;

Janglieranda, *Bom.*, Jatropha glandulifera, *Roxb.*, EUPHORBIACEÆ.
Dye ;

Jangli hulvul, *Dec.*, Cleome viscosa, *Linn* , CAPPARIDEÆ.
Oil ;

Janjhan, *Hind.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;

Janúm, *Hind.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Janwa, *Pb.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;

Jáphala, *Mahr.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Oil ;

Jargi, *Tel.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Jariya, *Hind.*, Brassica campestris, *Linn.*, CRUCIFERÆ.
Oil ;

Jarki-huldi, *Dec.*, *Hind.*, Coscinium fenestratum, *Colebr.*, MENISPERMACEÆ.
Dye ;

Jarul, *Beng.*, Lagerstrœmia Flos-Reginæ, *Retz.*, LYTHRACEÆ.
Gum ;

Jasavanda, *Bom.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;

Jashtimadhu, *Beng.*, *Bom.*, Glycyrrhiza glabra, *Linn.*, LEGUMINOSÆ.
Dye ;

Jasmine, Arabian, *Eng*, Jasminum Sambac, *Aiton.*, OLEACEÆ.
Oil ;

Jasmine, Spanish, *Eng.*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;

Jasum, *Dec.*, *Hind.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;

Jasut, *Dec.*, *Hind.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;

Jatamansi, *Beng.*, Nardostachys Jatamansi, *DC.*, VALERIANACEÆ.
Oil ;

Jati, *Mal.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Jati, *Hind.*, *Beng.*, *Sans.*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;

Jati, *Hind.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;

Jatiko, *Uriya*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Jatili, *Ass.*, Altingia excelsa, *Noronha*, HAMALIDEÆ.
Gum ;

Jatiphala, *Sans.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;

Jatipullum, *Cingh* , Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;

Jau, *Hind*, *Beng.*, Tamarix dioica, *Roxb.*, TAMARISCINEÆ.
Gum ;

Jau, *Hind.*, *Beng.*, Casuarina equisetifolia, *Forst.*, CASUARINACEÆ.
Gum ; Tan ;

Jauntari (Mace), *Hind.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;

Java-pushpamu, *Tel.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;

Javasa, *Bom.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;

Jawashir, *Pers.*, Ferula Galbaniflua, *Boiss*, UMBELLIFERÆ.
Gum ;

Jayanti, *Beng.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;

Jayapála, *Sans.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;

Jaypal, *Beng.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;

Jelladú, *Tel.*, Calatropis procera, R. *Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Jemudu, *Tel.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;

Jenapa-nara, *Tel*, Crotalaria juncea, *Linn*, LEGUMINOSÆ.
Fibre ;

Jenappa-nar, *Tam.*, Crotalaria juncea, *Linn.*, LEGUMINOSÆ.
Fibre ;

Jethi-madh, *Hind.*, Glycyrrhiza glabra, *Linn.*, LEGUMINOSÆ.
Dye ;

Jhadihaladi, *Dec.*, Coscinium fenestratum, *Colebrooke*, MINISPERMACEÆ.
Dye ;

Jhal, *Hind.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Jhal, *Raj.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Jhampi, *Hind.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;

Jhand, *Pb.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Jhar, *Sind.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Jhár, *Pb.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Jhárámbi, *Mahr.*, Garcinia Xanthochymus, *Hook.f.*, GUTTIFERÆ.
Gum ;

Jharan, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;

Jhau, *Hind.*, *Sind.*, *Beng.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, and T. gallica, *Linn*, TAMARISCINEÆ. Dye ; Tan ;

Jhaura, *Hind.*, Lagerstrœmia parviflora, *Roxb.*, LITHRACEÆ.
Gum ; Dye ; Tan ;

Jhinga, *Beng.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Jhingan, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Jhinja, *Ajmere*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Jhinjan, *Hind.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;

Jiaputa, *Hind.*, Putranjiva, Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;

Jiban, *N.-W. P.*, Odinia Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Jidi, *Tel.*, Semecarpus Anacardium, *Linn.*, *f.* ANACARDIACEÆ.
Gum ; Dye ; Oil ;

Jidi mamidi, *Tel.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ; Oils ;

Jilledu-chettu, *Tel.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Jinga, *Hind*, *Beng.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Jinti, *Chenab*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;
Jira, *Beng.*, Carum Carui, *Linn* , UMBELLIFERÆ.
Oil ;
Jira, *Beng.*, Cuminum Cyminum, *Linn.*, UMBELLIFERÆ.
Oil ;
Jiraka, *Sans.*, *Tel.*, Cuminum Cyminum, *Linn.*, UMBELLIFERÆ.
Oil ;
Jiri, *Tel.*, Semicarpus Anacardium. *Linn* , ANACARDIACEÆ.
Gum ; Dye ; Oil ;
Jiyal, *Beng.*, Odina Wodier, *Roxb.*
Gum ; Tan ; Fibre ;
Joba, *Beng.*, *Sans.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Jonkaphal, *Hind.*, Helicteres Isora , *Linn.*, STERCULIACEÆ.
Fibre ;
Jooreejur, *Sind.*, Casuarina equisetifolia, *Forster.*, CASUARINACEÆ.
Gum ;
Joti-Juti, *Hind.*, Putranjiva Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;
Jovi, *Tel.*, Fiscus Tsiela, *Roxb.*, URTICACEÆ.
Fibre ;
Jowa, *Beng.*, Bambusa Tulda, *Roxb.*, GRAMINEÆ.
Fibre ;
Jowan, *Beng.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
Juari, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Juephal, *Hind.*, Myristica moschata, *Willd*, MYRISTICEÆ.
Oil ;
Júk, *Pb.*, Impatiens Balsamina, *Linn.*, GERANIACEÆ.
Dye ;
Juk, *Pb.*, Impatiens Edgeworthii, *Hook.*, GERANIACEÆ.
Oil ;
Jum, *Beng.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Jungli badam-ka-tel, *Hind.*, Neeradimootoo oil.
Oil ;
Jupong, *Ass.*, Sponia orientalis, *Planch.*, URTICACEÆ.
Gum ;
Júríjur, *Sind.*, Casuarina equisetifolia, *Forst.*, CASUARINACEÆ.
Gum ; Tan ;
Jute, *Eng.*, Corchorus olitorius, *Linn.*, and C. capsularis, *Linn.*, TILIACEÆ.
Fibre ;
Jute, **American**, *Eng.*, Alentilon avecennæ, *Gaertn.*, MALVACEÆ.
Fibre ;
Juwa, *Beng.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Jy-chee, *Beng* , Euphorbia dracunculoides, *Lam.*, EUPHORBIACEÆ.
Oil ;

K.

Kaat-amunck, *Tam.*, Jatropha Curcas, EUPHORBIACEÆ.
Gum ;
Kabab-chini, *Beng.*, Guz., Piper Cubeba, *Linn.*, PIPERACEÆ.
Gum ; Oil ;
Kabaing, *Burm.*, Ceriops Roxburghiana, *Arnott.*, RHIZOPHOREÆ.
Tan ;
Kabal, *Cingh.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;

Kabaung, *Burm.*, Strychnos Nux-vomica, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Kabbar, *Sind.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;
Kabbar, *Sind.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;
Kabeng, *Burm.*, Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Kachal, *Kashmir*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;
Kachará, *Bom.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ;
Kachein, *Sutlej.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;
Kachír, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;
Kachnal, *Hind.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;
Kachnár, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Kachnár, *Hind.*, Bauhinia tomentosa, *Linn.*, LEGUMINOSÆ.
Fibre ; Oil ;
Kachnár, *Hind.*, Bauhinia acuminata, *Linn.*, LEGUMINOSÆ.
Oil ;
Kachorá, *Bom.*, Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;
Kachorá, *Bom.*, Curcuma zerumbet, *Roscoe.*, (*non Roxb.*), SCITAMINEÆ.
Dye ;
Kachu, *Kan.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kachúr, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;
Kachurá, *Hind.*, Curcuma zedoaria, *Roscoe*, (*non-Roxb.*), SCITAMINEÆ.
Dye ;
Kachúr-Kachu, *Pb.*, Hedychium spicatum, *Ham.*, SCITAMINEÆ.
Dye ;
Kadagho, *Tam.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Kadakai, *Tam.*, Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Gum ; Dye, Tan ; Oil ;
Kadalay, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Kadali, *Tam.*, Lagerstrœmia Flos-Reginæ, *Retz.*, LYTHRACEÆ.
Gum ;
Kadali, *Sans.*, Musa paradisiaca, & M. sapientum, *Linn.*, SCITAMINEÆ.
Dye ; Fibre ;
Kadam, *Nepal.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;
Kada-má, *Tam.*, Cerbera odallam, *Gaertn.*, APOCYNEÆ.
Fibre ; Oil ;
Kadami, *Tel.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Kadapgnam, *Burm.*, Cananga odorata, *Hook.f. & T.*, ANONACEÆ.
Oil ;
Kadar, *Arab.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;
Kaddu, *Hind.*, *Pb.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Kaddu, Safed, *Beng.*, *Hind.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;
Kadet, *Burm.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Kadi, *Pers.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;

Kadímah, *Beng.*, *Hind.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;

Kadmero, *Nepal.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;

Kadol, *Cingh.*, Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Tan ;

Kadot-kadet, *Burm.*, Connarus speciosus, *McLell.*, CONNARACEÆ.
Oil ;

Kadrajuvi, *Tel.*, Putranjiva Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;

Kadu, *Hind.*, Cucurbita maxima, *Duchesne*, CUCURBITACEÆ.
Oil ;

Kadu, *Nepal*, Gynocardia odorata, *R. Br.*, BIXINÆ.
Oil ;

Kadukar, *Tel.*, Terminalia Chebula, *Rets.*, COMBRETACEÆ.
Oil ;

Kafur, *Hind.*, *Pers.*, CAMPHOR.
Oil ;

Kagara, *Hind.*, *Mahr.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Kaghuti, *Nepal*, Edgeworthia Gardneri, *Meisn.*, THYMELÆACEÆ.
Fibre ;

Kaghuti, *Nepal*, Daphne papyracea, *Wall.*, THYMELÆACEÆ.
Ffbre ;

Kagiri, *Khasia*, Ficus elastica, *Bl.*, URTICACEÆ.
Gum ;

Kagshi, *Kumaun.*, Villebrunea frutescens, *Blume*, URTICACEÆ.
Fibre ;

Kahenyok, *Lepcha*, (in Gamble's list) Hedyotis capitellata, *Wall*, RUBIACEÆ. Dye ;

Kahi, *Pb.* Sáccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Kahu, *Hind.*, Lagenaria vulgaris, *DC.* COMPOSITÆ.
Oil ;

Kahu, *Sind.*, Sáccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Kahuá. *Hind.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye, Tan ;

Kaida, *Mal.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;

Kai-day, *Mechi.*, Symplocos racemosa, *Roxb.*, STYRACEÆ.
Dye ; Tan ; Mordant ;

Kaikar, *Hind.*, *C.P.* Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Kaikra, *Gond*, Odina Wodier, *Roxb.*, ANACARDICEAÆ.
Gum ; Tan ; Fibre ;

Kail, *Hind.*, Pinus excelsa, *Wall*, CONIFERÆ.
Gum ;

Kaimal, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Kain, *Pb.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;

Kaiphal, *N.-W. P.*, Myrica sapida, *Wall.*, MYRICACEÆ.
Tan ;

Kaisho, *Ass.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;

Kaist, *Tam.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Oil ;

Kait, *Hind.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Oil ;

Kaita-du, *And.*, Artocarpus Chaplasha, *Roxb.*, URTICACEÆ.
Gum ;

Kajra, *Hind.*, *Mahr.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ; Oil ;

Káju, *Mahr.*, *Hind.*, *Bom.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ; Dye ; Oil ;

Kaka, *Pb.*, Pistacia integerrima, *J. L. Stewart,* ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Kákadasingí, *Bom.,* (Galls of) Rhus succedanea, *Linn.*, ANACARDIACFÆ.
Oil ;

Kákadi, *Bom.,* Cucumis Melo, *L.,* utilissimus (*sp. Roxb.*), CUCURBITACEÆ.
Oil ;

Kákadi, *Bom.*, Cucumis sativus, *L.*, CUCURBITACEÆ.
Oil ;

Kákamári, *Sans.,* Ananurta coculus, *W. & A.*, MENISPERMACEÆ.
Oils ;

Kakari-kai, *Tam.*, Cucumis Melo, L., momordica (*sp. Roxb.*) CUCURBITACEÆ. Oil ;

Kaki, *Tam.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ;

Kaki-champa, *Tel.*, Anamirta Coculus, *W.* & *A.*, MENISPERMACEÆ.
Oils ;

Kakkar, *Pb.*, Pistacia integerrima, *J. L. Stewart,* ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Kákmári, *Hind.*, *Dec.*, Anamirta Coculus, *W.* & *A.*, MENISPERMACEÆ.
Oils ;

Kákola, *Mahr.*, Piper Cubeba, *Linn. f.*, PIPERACEÆ.
Oil ;

Kakra, *Beng.*, Bruguiera gymnorhiza, *Lam.*, RHIZOPHOREÆ.
Tan ;

Kakrasinghi, *Beng.*, Pistacia integerrima, *J. L. Stewart*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Kakrezi, *Furukhabad*, Iron Sulphate.
Dye ;

Kakri, *Beng.*, Cucumis Melo, *L.*, utilissimus (*sp. Roxb.*) CUCURBITACEÆ.
Oil ;

Kakri, *Pb.*, Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;

Kaksh, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;

Kala, *Beng.*, Musa paradisica, and M. sapientum, *Linn.*, SCITAMINEÆ.
Dye ; Fibre ;

Kala, *Hind.*, *Beng.*, *Tel.*, Ocimum sanctum, *var*, sanctum, LABIATÆ.
Oil ;

Kala-buntha, *Tam.*, Aloe vera, LILIACEÆ.
Dye ; Fibre ;

Kala dammar, *Hind.*, *Beng.*, *Gus.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;

Kala-goru, *Tel.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ;

Kalaka, *Tam.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;

Kálakadú, *Bom.*, *Mahr.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;

Kalakadu, *Mahr.*, *Hind.*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;

Kala-kasturi, *Beng.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;

Kalakat, *Pb.*, Prunus Padus, *Linn.*, ROSACEÆ.
Gum ;

Kalarukh, *Mahr.,* Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;

Kalasunda, *Mahr.*, Barleria prionitis, *Linn.*, ACANTHACEÆ.
Gum ;
Kala-til, *Hind.*, Guizotia abssyinica, *Cass.*, COMPOSITÆ.
Oil ;
Kala titmaliya, *Kumaun*, Viburnum coriaceum, *Bl.*, CAPRIFOLLIACEÆ.
Oil ;
Kal-baghi, *Kan.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;
Kal-baghi, *Kan.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ;
Kalein, *Burm.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Kalejai, (color produced from) Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Kalejai, *Allahabad*, see Iron Sulphate.
Dye ;
Kalejira, *Bom.. Hind.*, Nigella sativa, *Linn.*, RANUNCULACEÆ.
Oil ;
Kaliendya, *Burm.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Kaliezeorie, *Hind.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Kalilara, *Nepal.*, Marsdenia tinctoria, *R. Br.*, ASCLEPIADEÆ.
Fibre ; Dye ;
Kalingada, *Mahr.*, Citrullus vulgaris, *Schrad.*, CUCURBITACEÆ.
Oil ;
Kallu, *Salt Range*, Chamærops Ritchieana, *Griff.*, PALMÆ.
Fibre ;
Kalium, *Salt Range,* Chamærops Ritchieana, *Griff.*, PALMÆ.
Fibre ;
Kalivikaya, *Tel.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Kali-zeerie, *Dec.*, Vernonia anthelmintica., *Willd.*, COMPOSITÆ.
Oil ;
Kalkilingi, *Nilgiris*, Cedrela Toona, *Roxb.*, MALIACEÆ.
Gum ; Dye ;
Kalla-kasturi, *Hind.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Kally Chemuda, *Tel.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Kálongi, *Bom.*, *Hind.*, Nigella sativa, *Linn.*, RANUNCULACEÆ.
Oil ;
Kalru, *Ajmir*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Kalsis, *Hind.*, Abbizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;
Kalwa, *Burm.*, Cerbera Odollam., *Gaertn.*, APOCYNACEÆ.
Fibre ; Oil ;
Kalyáná-murukku, *Tam.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Kamal, *Mysore*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Kamal, *Pb.*, *Hind.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ;
Kamala, *Sind.*, Nelumbium speciosum., *Willd.*, NYMPHÆACEÆ.
Fibre ;
Kamalakadi, *Sind.*, Nelumbium speciosum, *Willd.*, NYMPHÆACEÆ.
Fibre ;
Kámalguri, *Beng.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Kamalottara, *Sans.*, Carthamus tinctoria, *Linn.*, COMPOSITÆ.
Dye ; Oil ;

Kamanji, *Tam.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Kamarakas, *N.-W. P.* (Gum of) Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ;
Kamarri, *Hind.*, *Gus.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;
Kambal, *Pb.*, Rhus Wallichii, *Hook. f.*, ANACARDIACEÆ.
Oil ;
Kambi, *Kan.*, Gardenia gummifera, *Linn.*, RUBIACEÆ.
Gum ;
Kambu, *Tam.*, Penicillaria spicata, *Willd.*, GRAMINEÆ.
Dye ;
Kamela, *Pb.*, *Hind.*, Mallotus philippinensis, *Müll.-Arg* GRAMINEÆ.
Dye ; Oil ;
Kam kasturi, *Kan.*, Ocimum Basilicum., *Linn.*, LABIATEÆ.
Fibre ;
Kamlái, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Kamli, *Nepal.*, Bohmeria macrophylla, *Don.*, URTICACEÆ.
Fibre ;
Kamini, *Beng.*, Murraya exotica, *Linn.* (Murraya Kœnigii, *Spr.*,) RUTACEÆ.
Oil ;
Kammaregu, *Tel.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;
Kamo, *Sind.*, Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Tan ;
Kampilla, *Sans.*, Mallotus philippinensis, *Müll.-Arg.*, EUPHORBIACEÆ.
Oil ;
Kamra, *Kan.*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Kámrángá, *Beng.*, Averrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;
Kamwepila, *Tam.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Kan, *Tam.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kana, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Kanagi, *Kan.*, Myristica malabarica, *Lam.*, MYRISTICEÆ.
Oil ;
Kana-goraka, *Cingh.*, Garcinia Morella, *Desr.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;
Kanalla, *Hind.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;
Kanalu, *Dec.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;
Kánana erand, *Sans.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;
Kanapa, *Tel.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;
Kanazo, *Burm.*, Baccaurea sapida, *Müll.-Arg.*, EUPHORBIACEÆ.
Dye ; Mordant ;
Kánchan, *Mahr.*, Bauhinia, variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kanchan, *Beng.*, Bauhinia acuminata, *Linn.*, LEGUMINOSÆ.
Oil ;
Kánchan, *Tel.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;
Kanchini, *Tam.*, Bauhinia tomentosa., *Linn.*, LEGUMINOSÆ.
Fibre ; Oil ;
Kanchivalo-do, *Kan.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Kanchu, *Tel.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Kanda, *Mahr.*, Allium Cepa, *Linn.*, LILIACEÆ.
Oil ;

Kandal, *Bokhara*, Dorema Ammoniacum, *Don.*, UMBELLIFERÆ.
Oil ;

Kandalanga, *Tam.*, Carapa moluccensis, *Lam.* MELIACEÆ.
Gum ; Oil ;

Kándan, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Kandan, *Hind.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;

Kandi, *Sind*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Kandiara, *Pb.*, Carthamus oxyacantha, *Bieb.*, COMPOSITÆ.
Oil ;

Kandiari, *Pb.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ;

Kandira, *Bom.*, Musa textilis, *Louis.*, *Nees.*, SCITAMINEÆ.
Fibre ;

Kandla, *Hind.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;

Kándúla, *Mahr.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Fibre ;

Kaner, *Hind.*, *N.-W. P.*, *Pb.*, Nerium odorum, *Soland*, APOCYNACEÆ.
Oil ;

Kanga, *Tel.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;

Kangai, *Hind.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;

Kangar, *Pb.*, Pistacia integerrima, *J. L. Stewart*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Kangar, *N.-W. P.*, Anthistiria arundinacæ, *Roxb.*, GRAMINEÆ.
Fibre ;

Kanghi, *Hind.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;

Kangi, *Nepal.*, Wendlandia tinctoria, *DC.*, RUBIACEÆ.
Mordant ;

Kanglu, *Pb.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Kangoi, *Dec.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;

Kanguni, *Bom.*, Celastrus paniculatus, *Willd.*, CELASTRINEÆ.
Oil ;

Kanhera, *Bom.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Kanhil, *Lepcha*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Kaníár, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Kaniar, *Hind.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Kanira, *Kan. Pb.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Kaniyúr, *Hind.*, *N.-W. P.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Kanj, *Hind.*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;

Kanju, *Kumaun*, Ulmus integrifolia, *Roxb.*, URTICACÆ.
Oil ;

Kanka, *Tel.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;

Kanka, *Tel.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;

Kankada, *Bom.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Kankola, *Bom.*, Piper Chaba, *Bl.*, PIPERACEÆ.
Dye ;

Kankola, *Mahr.*, Piper Cubeba, *Linn.*, PIPERACEÆ.
Gum ;

Kankra, *Beng.*, Bruguiera gymnorrhiza, *Linn.*, RHIZOPHOREÆ.
Tan ;

Kankrei, *Hind.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Kankri, *Hind.*, Cucumis Melo, *L.*, utilissimus. (*sp. Roxb.*,) CUCURBITACEÆ. Oil ;

Kanlas, *Hind.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;

Kanmar, *Hind.*, Sapindus Mukorossi, *Roxb.*, SAPINDACEÆ.
Gum ;

Kanmar, *Hind.*, Sapindus Mukorossi, *Gærtn.*, SAPINDACEÆ.
Oil ;

Kannucli, *Him. name*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Gum ;

Kannu-palle, *Tam.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Kanom, *Lepcha*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Káns, *Pb.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Káns, *Hind.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Kanseri, *Meywar*, Dolichandrons falcata, *Seem.*, BIGNONIACEÆ.
Fibre ;

Kanta, *N.-W. P.*, Zizyphus nummularia, *W. & A.*, RHAMNEÆ.
Gum ;

Kantala, *Sans.*, Agave vivipara, *Linn.*, AMARYLLIDEÆ.
Fibre ;

Kantan, *Hind.*, Eriodendron aufractuosum, *DC.*, MALVACEÆ.
Gum ;

Kántá-naté, *Beng.*, Amarantus spinosus, *Willd.*, AMARANTACEÆ.
Dye ;

Kántá-natia, *Beng.*, Amarantus spinosus, *Willd.*, AMARANTACEÆ.
Dye ;

Kantela, *N.-W. P.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ;

Kante-mat, *Dec.*, Amarantus spinosus, *Willd.*, AMARANTACEÆ.
Dye ;

Kante-mátha, *Bom.*, Amarantus spinosus, *Willd.*, AMARANTACEÆ.
Dye ;

Kánthál, *Beng.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Kantiari, *Pb.*, Carthamus oxyacantha, *Bieb.*, COMPOSITÆ.
Oil ;

Kanwal, *Hind.*, Nelumbium speciosum., *Willd.*, NYMPHÆACEÆ.
Fibre ;

Kanyá, *Sans.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;

Kanyin, *Burm.*, Dipterocarpus alatus, *Roxb.*, DIPTEROCARPEÆ.
Gum ;

Kanyin-ni, *Burm.*, Dipterocarpus lævis, *Ham.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Kanyin-ni, *Burm.*, Dipterocarpus turbinatus, *Gaertn. f.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Kanyoung, *Magh.*, Dipterocarpus turbinatus, *Gaertn. f.*, DIPTEROCARPEÆ.
Gum ; Oil ;
Kanzan, *Burm.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Kao, *Pb.*, Olea ferruginea, *Royle*, OLEACEÆ.
Oil ;
Kaoung-wa, *Magh.*, Metocanna bambusoides, *Trim.*, GRAMINEÆ.
Fibre ;
Kápás, *Beng.*, *Dec.*, Gossypium herbaceum, *Linn.*, MALVACEÆ.
Fibre ;
Kapasi, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Kapasi, *Hind.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;
Kapasiya, *N.-W. P.*, Hibiscus ficulneus, *Linn.*, MALVACEÆ.
Fibre ;
Kaphal, *N.-W. P.*, Myrica sapida, *Wall.*, MYRICACEÆ.
Tan ;
Kapila, *Bom.*, *Tam.*, Mallotus philippinensis, *Müll.-Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Kapli, *Tam.*, Mallotus philippinensis, *Müll.-Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Kapur kachri, *see* Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;
Kapur kachri, *Pb.*, Hedychium spicatum, *Ham.*, SCITAMINEÆ.
Dye ;
Karabi, *Beng.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;
Karachu, *C. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Karai-gond, *Bom.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ; Fibre ;
Karail, *Beng.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;
Karail, *Beng.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;
Karaka, *Tel.*, Terminalia Chebula, *Rets.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Karakana, *Bom*, Grewia tiliæfolia, *Vahl.*, LEGUMINOSÆ.
Fibre ;
Karako, *Tel.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;
Karallu, *Bom.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;
Karamara, *Bom.*, Averrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;
Kara marda, *Tam.*, Terminalia tomentosa, *W. & A*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Karamcha, *Beng.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Kuram kanda, *Nepal*, Oraxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Karanga, *Hind.*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;
Karangal, *Pb.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Karangalli, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Karangi, *Mysore*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Karanj, *Hind.*, *Bom.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;

Karanja, *Beng.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;
Karanji, *Hind.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Karapu dammar, *Tam.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;
Karapu kongiliam, *Tam.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;
Karár, *Pb.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;
Karaunda, *Hind*, Carrissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Karavanda, *Mahr.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Karavira, *Sans.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;
Karbuz, *N.-W. P.*, Citrullus vulgaris, *Schrad.*, CUCURBITACEÆ.
Oil ;
Kardai, *Sind.*, (seeds of) Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ;
Kare, *Kan.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Karedha, *Uriya*, Terminalia Chebula, *Retz.*, COMBRETACEÆ.
Oil ;
Karepak, *Tel.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Kareta, *Beng.*, *Hind.*, Sida carpinifolia, *Linn.*, MALVACEÆ.
Fibre ;
Karhi-nimb, *Mahr.*, Murraya Kœnigii, *Spreng.*, RUTACEÆ.
Oil ;
Karhar, *Hind.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Kargnalia, *Hind.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;
Kari, *Hind.*, Phyllanthus nepalensis, *Müll-Arg.*, EUPHORBIACEÆ.
Tan ;
Karijali mara, *Kan.*, Acacia arabica, *Willd* , LEGUMINOSÆ.
Fibre ;
Karinga, *Tel.*, Gardenia lucida, *Roxb.*, RUBIACEÆ.
Gum ;
Karingi, *Nepal*, Wrightia tomentosa, *Röm & Scheult.*, APOCYNACEÆ
Dye ;
Karir, *Hind.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;
Karivepa, *Tel.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Kariya-polam, *Tam.*, Aloe vera, *Linn* , LILIACEÆ.
Dye ; Fibre ;
Karka, *Gond.*, Terminalia Chebula, *Rets.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Karka, *Beng.*, Arundo Karka, *Roxb.*, GRAMINEÆ.
Fibre ;
Karkanna, *Afg.*, Ziziphus nummularia, *W. & A.*, RHAMNEÆ.
Gum ;
Karkapilly, *Tam.*, Pithecolobium dulce, *Benth.*, LEGUMINOSÆ.
Oil ;
Karkath, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Karkava, *Tam.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;
Karkaya, *Hyderabad*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Kárla, *Pb.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Karmai, *Beng.*, Bauhinia malabarica, *Willd.*, LEGUMINOSÆ.
Gum ;
Karmal, *Pb.*, Peganum Harmala, *Linn.*, RUTACEÆ.
Dye ; Oil ;
Karmal, *Hind.*, Averrhoa Carambola, *Linn.*, GERANICEÆ.
Dye ;
Karmurada, *Sans.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Karo, *Hind.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Karoh, *Oudh*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ;
Karomanga, *Tel.*, Averrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;
Kárpas, *Sans.*, Gossypium herbaceum *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Kárpás, *Sans*, Gossypium arboreum, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Karpur, *Beng.*, Camphor.
Oil ;
Karpura, *Sans.*, Camphor.
Oil ;
Karpuram, *Tel.*, Camphor.
Oil ;
Karpuva-arishi, *Tam.*, Psoralia corylifolia, *Linn.*, LEGUMINOSÆ.
Oil ;
Karra marda, *Tam.*, Terminalia tomentosa, *W.* & *A.*, COMBRETACEÆ.
Gum ;
Karre vembu, *Tam.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Karri, *Hind.*, Saccopetalum tomentosum, *Hook.*, ANONACEÆ.
Gum ;
Karroná, *Hind.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Karruwa, *Tam.*, Cinnamonum zeylanicum, *Breyn.*, LAURACEÆ.
Dye ; Oil ;
Karu, *Tel.*, Psorelea corylifolia, *Linn.*, LEGUMINOSÆ.
Oil ;
Karúnda, *Hind.*, Carissa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;
Karapale, *Tam.*, Putranjiva Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;
Karuppuram, *Tam.*, Camphor.
Oil ;
Karuvaya, *Tam.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum ;
Karuvelum, *Tam.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;
Kásá, *Sans.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;
Kash, *Beng.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;
Kashappu, *Tam.*, Prunus amygdalus, *Boill.*, ROSACEÆ.
Gum ; Oil ;
Kashfa, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kashi, *Garo.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Kashmal, *Hind.*, Berberis Lycium, *Royle.*, BERBERIDEÆ.
Gum ; Oil ;

Kashmal, *Hind.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Kashti, *Him. name*, *Ravi.*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Gum ; Oil ;
Kashu, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kashu katti, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kashumba, *Tam.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ; Oil ;
Kasir, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;
Kasis, *Hind.*, *Beng.*, Protosulphate of Iron.
Dye ;
Kasmal, *Simla*, Berberis Lycium, *Royle*, BERBERIDEÆ.
Gum ; Oil ;
Kasmal, *Pb.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Kasrike, *Mysore*, Casuarina equisetifolia, *Forster*, CASUARINEÆ.
Gum ; Tan ;
Kassi, *Hind.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Kasturi, *Hind.*, *Bom.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Kastura-benda, *Tam.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Kasturi-bendavittulu, *Tel.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Kasturi-manjal, *Tam.*, Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;
Kasturipapusa, *Tel.*, Curcuma aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;
Kasul, *Gondi*, Grewia tiliæfolia, *Vahl.*, LEGUMINOSÆ.
Fibre ;
Katan, *Hind.*, Eriodendrou anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Katarali, *Tam.*, Cerbera Odollam, *Gærtn.*, APOCYNACEÆ.
Fibre ; Oil ;
Katat, *Burm.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ
Dye ;
Kat-bel, *Hind.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;
Kat-ber, Zizyphus xylopyra, *Willd.*, RHAMNEÆ.
Gum ; Tan ;
Katbhilawa, *Garhwal*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;
Katele, *Pb.*, Argemone mexicana, *Linn.*, PUPAVERACEÆ.
Gum ;
Katgúli, *N.-W. P.*, Salix Wallichiana, *And.*, SALICINEÆ.
Fibre ;
Kath, *Hind.*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan ;
Kath, *Nepal.*, Adhatoda Vasica, *Nees*, ACANTHACEÆ.
Dye ;
Kathá, *Hind.*, *Dec.*, *Bom.*, *Beng.*, *Pb.*, Acacia Catechu, *Willd.* LEGUMINOSÆ. Gum ;
Kathe, *Burm.*, Samadera indica, *Gærtn.*, SIMARUBEÆ.
Oil ;
Kathalai, *Tam.*, Agave vivipara., *Linn.*, AMARYLLIDEÆ.
Fibre ;
Kathalya gond, *Bomb.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ;

Kath-bel, *Beng.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;
Kathe, *Kashmir*, Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ.
Fibre ;
Kathekasturi, *Tam.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Katila, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Katilá, *Hind.*, Astragalus hamosus, *Linn.*, LEGUMINOSÆ.
Dye ;
Kat illipi, *Tam.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Tan ; Oil ;
Kat illupi, *Tam.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Katira (The Gum), Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Katira, *Pb.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Katkaranj, *Hind.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;
Kat-maá, *Tam.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Kat-maá, *Tam.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Katmowa, *Garwhal*, Phyllanthus nepalensis, *Müll. Arg.*, EUPHORBIACEÆ.
Tan ;
Katorí, *Sind.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;
Katpoon, *Kan.*, Calophyllum Wightianum, *Wall.*, GUTTIFERÆ.
Oil ;
Katrar, *Kumaun*, Acacia Intsia, *Willd.*, LEGUMINOSÆ.
Dye ;
Katsirsa, *Oudh*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Katta-kambu, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kattale, *Tam.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;
Kattang, *Hind.*, Bambusa arundinacea, *Rets.*, GRAMINEÆ.
Fibre ;
Katti, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Katti mundu, *Tel.*, Euphorbia Cattimandoo, *Elliot*, RUTACEÆ.
Gum ;
Katnim, *Hind.*, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Kattra, *Ass.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Kattu, *Tam.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Kat turangi, *Tam.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;
Kattús, *Nepal.*, Quercus pachyphylla, *Kurs.*, CUPULIFERÆ.
Dye ; Tan ;
Kattut-tumatti, *Tam.*, Cucumis trigonus, *Roxb.*, CUCURBITACEÆ.
Oil ;
Katu-imbul, *Cingh.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Oil ;
Kat vaghe, *Tam.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;
Katyalu, *Tam.*, Atalantia monophylla, *Corr.*, RUTACEÆ.
Oils ;

Kau, *Hind.*, *Pb.*, Olea ferruginea *Royle*, OLEACEÆ.
Oil ;

Kaunki, *N.-W. P.*, Rhus Wallichii, *Hook, f.*, ANACARDIACEÆ.
Oil ;

Kaurijal, *Pb.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Kauri-van, *Pb.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Kaya, *Burm.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;

Kávali, *Mahr.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ; Fibre ;

Kavanchi, *Tel.*, Helicteres Isora., *Linn.*, STERCULIACEÆ.
Fibre ;

Kavatha, *Sind.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ; Oil ;

Kawili, *Tam.*, Sterculia guttata., *W. & A.*, STERCULIACEÆ.
Fibre ;

Kayan, *Burm.*, Excæcaria Agallocha, *Willd.*, EUPHORBIACEÆ.
Gum ;

Káya-phala (mace) *Bom.*, Myristica malabarica, *Lam.*, MYRISTICEÆ.
Oil ;

Káyaphala, *Bom.*, Myrica sapida, *Wall.*, MYRICACEÆ.
Tan ;

Kayu-puti, *Eng.*, Matricaria Chamomila, *Linn.*, COMPOSITÆ.
Oil ;

Kazhirah, *Pers.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ;

Kazu, *Lepcha*, Girardinia heterophylla, *Decaisne.*, URTICACEÆ.
Fibre ;

Kchai-tun, *Phekial*, Morinda angustifolia, *Roxb.*, RUBIACEÆ.
Dye ;

Kea, *Beng.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;

Keenatil, *Ceylon*, *See* Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;

Keharsu, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;

Kekuna, *See* Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Oils ;

Kela, *Hind.*, *Bom.*, Musa paradisiaca, and M. sapientum, *Linn.*,
SCITAMINEÆ. Dye ; Fibre ;

Kelu, *Him. name*, Cedrus Deodara, *Loudon*, MELIACEÆ.
Gum ;

Kempu géru, *Kan.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ;

Kemuka, *Bom.*, *Sans.*, Costus speciosus, *Sm.*, SCITAMINEÆ.
Oil ;

Kenbun, *Burm.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;

Kend, *Beng.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ;

Kendu, *Ass.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;

Kendu, *Hind.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ;

Kao-khin, *Burm.*, Alum.
Dye ;

Keol, *Hind.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Gum ;

Keoli, *Him. name*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Gum ;

Keor, *Pb.*, Wrightia tomentosa, *Roem.* and *Scheult*, APOCYNACEÆ.
Dye ;

Keori, *Beng.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;

Keram, *Bom.*, Guizotia abyssynica, *Cass.*, COMPOSITÆ.
Oil ;

Kerasya, *Arab.*, Pranus Cerasus, *Linn.*, ROSACEÆ.
Gum ;

Keri, *Pb.*, Girardinia heterophylla, *Decaisne.*, URTICACEÆ.
Fibre ;

Kering, *Garo*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Kesar, *Hind.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;

Késara, zafran, *Hind.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;

Kesarája, *Beng.*, Wedelia calendulacea, *Less.*, COMPOSITÆ.
Dye ;

Keshwri, *Beng.*, Eclipta alba., *Hassk.*, COMPOSITÆ.
Dye ;

Kesuti, *Beng.*, Eclipta alba, *Hassk.*, COMPOSITÆ.
Dye ;

Ketmi de Cochin Chine, *Fr.* Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;

Ketuki, *Beng.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;

Keú, *Beng.*, *Hind.*, Costus speciosus, *Sm.*, SCITAMINEÆ.
Oil ;

Keura, *Hind.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;

Kevana, *Bom.*, Helicteres Isora., *Linn.*, STERCULIACEÆ.
Fibre ;

Kewan, *Bom.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;

Keysuria, *Beng.*, Eclipta alba., *Hassk.*, COMPOSITÆ.
Dye ;

Khadira, *Sans.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Khair, *Hind.*, *Dec.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Khairwál, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Khaja, *Hind*, Briedelia retusa, *Spreng*, EUPHORBIACEÆ.
Tan ;

Khaja, *Hind.*, Briedilia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;

Khaji, *Hind.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ; Fibre ;

Khajur, *Hind.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ; Fibre ;

Khakhan, *Mahr.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Oil ;

Khakhan, *Mahr.*, Salvadora persica, *Linn,*, SALVADORACEÆ.
Oil ;

Khaki, *Allahabad*, See Iron Sulphate.
Dye ;

Khamrak, *Dec.*, Averrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;

Khamraka, *Bom.*, Averrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;

Khan, *Sind.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Khandúra, *N.-W. P.*, Anthistiria arundinacæ, *Roxb.*, GRAMINEÆ.
Fibre ;

Khánkhina, *Bom.*, Salvadora Oleoides, *Linn.*, SALVADORACEÆ.
Dye ;

Kháoi, *Nepal.*, Sponia politoria, *Planch.*, UBTICACEÆ.
Fibre ;

Khar, *Pb.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Kharabúja, *Bom.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;

Kharái, *Pb.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;

Kharani, *Nepal.*, Symplocos theæfolia, *Ham.*, STYRACEÆ.
Dye ;

Kharbúja, *Hind.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;

Kharbúj, Cucurbita moschata, *Duchesne*, CUCURBITACEÆ.
Oil ;

Khare-vazhum, *Pers.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;

Khareza, *Pb.*, Carthamus oxyacantha, *Bieb.*, COMPOSITÆ.
Oil ;

Kharidjar, *Sind.*, Salvadora persica, *Linn.*, SALVADORACEÆ.

Kharmuj, *Beng.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;

Kharpat, *Beng.*, *Pb.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Kharua, *Hind.*, see Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;

Kharwala, *Afg.*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;

Kharzahra, *Pers.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;

Khas, *Hind.*, Andropogon muricatus, *Rets.*, GRAMINEÆ.
Fibre ; Oils ;

Khasaroa, *Hind.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Khas-khas, *Beng.*, Andropogon muricatus, *Retz.*, GRAMINEÆ.
Fibre ; Oils ;

Khas-khas-ka-post, *Dec.*, Papaver somniferum, *Linn.*, PAPAVERACEÆ.
Oil ;

Khassach, *Pers.*, Ferula galbaniflua, *Boiss.*, UMBELLIFERÆ.
Gum ;

Khau, *Sind.*, Olea ferruginea, *Royle*, OLEACEÆ.
Oil ;

Khayer, *Beng.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ;

Khenti jund, *Kaghan.*, Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ.
Fibre ;

Kheri-nun, Sulphate of Soda. *See* Salt.

Khesla, *Gond.*, Grewia tiliæfolia, *Vahl.*, LEGUMINOSÆ.
Fibre ;

Kheu, *Manipur*, Melanorrhœa usitata, *Wall.*, ANACARDIACEÆ.
Gum ;

Khewnan, *Hind.*, Ficus Cunia., *Buch.*, URTICACEÆ.
Fibre ;

Khijra, *Raj*,, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Khili, *Gáro*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Khin, *Kumaun*, Acacia lenticularis, *Ham.*, LEGUMINOSÆ.
Gum ;

Khip, *Delhi*, Orthanthera viminea., *Wight.*, ASCLEPIADACEÆ.
Fibre ;

Khir, *Hind.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Khira, *Hind.*, *Bom.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;

Khirdal, *Arab.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Khirni, *Hind.*, *Mahr.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Khirni, *Meywar*, Wrightia tinctoria, *R. Br.*, APOCYNACEÆ.
Dye ;

Khoausi, *Mahr.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;

Khoira, *Ass.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Khoobani, *Hind.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Oil ;

Khor, *Sind.*, Acacia Senegal, *Willd.*, LEGUMINOSÆ.
Gum ;

Khori, *Beng.*, Saccharum semidecumbens, *Roxb.*, GRAMINEÆ.
Fibre ;

Khour, *Nepal*, Acacia ferruginea, *DC.*, LEGUMINOSÆ.
Gum ;

Khubani, *Hind.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Gum ;

Khulen, *Pb.*, Ulmus integrifolia, *Roxb.*, URTICACÆ.
Oil ;

Khum, *Manipur*, Strobilanthes flaccidifolius, *Nees.*, ACANTHACEÆ.
Dye ;

Khuma, *Manipur*, Strobilanthes flaccidifolius, *Nees.*, ACANTHACEÆ.
Dye ;

Khumbi, *Hind.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;

Khurbúj, *Hind.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;

Khurhur, *Hind.*, Ficus Cunia, *Buch.*, URTICACEÆ.
Fibre ;

Khúri, *Pb.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;

Khwan, *Trans-Indus*, Olea ferruginea, *Royle*, OLEACEÆ.

Khyáa, *Burm.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ; Oil ;

Khyar, *Pers.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;

Kiamil, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ;

Kiar, *Pb.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Kich-chilik-kizhangu, *Tam.*, Curcuma Zedoaria, *Roscoe* (*non-Roxb.*), SCITAMINEÆ. Dye ;

Kichlie-gaddalu, *Tel.*, Curcuma Zedoaria, *Roscoe* (*non-Roxb.*), SCITAMINEÆ.
Dye ;

Kiditsai, *Chinese*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Kikajon, *Hebrew*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;

Kikar, *Hind.*, *Bom.*, *Pb.*, *Dec.*, Acacia arabica, *Willd.*, LEGUMINOSEÆ.
Gum ; Dye ;

Kiki, *Jewish*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;

Kilar, *Him. name*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Gum ;
Kilár, *Pb.*, Parrotia Jacquemontiana *Decaisne*, HAMAMELIDEÆ.
Fibre ;
Kilawa, *Pb.*, Wrightia tomentosa, *Roem* and *Scheult.*, APOCYNACEÆ.
Dye ;
Kili, *Bom.*, Albizza procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Kalik, *N.-W .P.*, Saccharum fuscum, *Roxb.*, GRAMINEÆ.
Fibre ;
Kilmira, *Pb.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Kilu, *Salt Range*, Chamærops Ritchieana, *Griff.*, PALMÆ.
Fibre ;
Kimul, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Kinai, *Mahr.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Kindal, *Mahr.*, Terminalia paniculata, *W.* & *A.*, COMBRETACEÆ.
Dye ; Tan ;
Kingi, *Pb.*, Girardinia heterophylla., *Decaisne*, URTICACEÆ.
Fibre ;
Kingma, *Chinese*, Abutilon Avicenœ, *Gaertn.*, MALVACEÆ.
Fibre ;
Kini, *Bom.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Kinjal, *Mahr.*, Terminalia paniculata, *W.* & *A.*, COMBRETACEÆ,
Dye ; Tan ;
Kinneh, *Pers.*, Ferula Galbaniflora, *Boiss.*, UMBELLIFERÆ.
Gum ;
Kino, *Eng.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Kino, Bengal, *Eng.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ;
Kip, *Sind.*, Orthanthera viminea , *Wight*, ASCLEPIADEÆ.
Fibre ;
Kiramber, *Tam.*, Caryophyllus aromaticus, *Linn.*, MYRTACEÆ.
Oil ;
Kiri, *Sind.*, Ceriops Candolleana, *Arnot.*, RHIZOPHOREÆ.
Tan ;
Kiri, *Kashmir*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;
Kirkiria, *Hind.*, Cinnamomum Tamala, *Nees.*, LEGUMINOSÆ.
Kirma, *Nepal.*, Villebrunea frutescens, *Blume.*, URTICACEÆ.
Fibre ;
Kirna *Hind.*, Saccopetalum tomentosum, *Hook.*, ANONACEÆ.
Gum ;
Kirrari, *Sind.*, Ceriops Candolleana, *Arnot.*, RHIZOPHOREÆ.
Tan ;
Kirru, *Pb.*, Parrotia Jacquemontiana, *Decaisne*, HAMAMELIDEÆ.
Fibre ;
Kishur, *Beng.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Kishur Kundur, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kitchli, *Tam.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Kitoli, *N.-W. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Kittali, *Tel.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;

Kittul, Caryota urens, *Linn*, PALMÆ.
Fibre ;

Kitwali, *N. W. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Ko, *Pb.*, Olea ferruginea, *Royle*, OLEACEÆ.
Oil ;

Koámil, P*b.*, Phyllanthus nepalensis, *Müll. Arg.*, EUPHORBIACEÆ.
Tan ;

Koan, P*b.*, Tamarix articulata, *Vahl.* T. dioca, *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;

Koat amunak, *Tam.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;

Kobusi, *Nepal*, Myrica sapida, *Wall.*, MYRICACEÆ.
Tan ;

Kochi, *Hind.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;

Kodoga-pala, *Tel.*, Holarrhena antidysenterica, *Wall.*, APOCYNACEÆ.
Oil ;

Kodu, *Beng.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;

Kohi, *Pb.*, Alnus nepalensis, *D Don*, CUPULIFERÆ.
Dye ; Tan ; Oils ;

Kohola, *Mahr.*, Benincasa, cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;

Kohú, *Sind.*, Olea ferruginea, *Royle*, OLEACEÆ.
Oil ;

Kohumba, *Gus.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ;

Kohundan rangul, *C. P.*, Celastrus paniculatus, *Willd.*, CELASTRINEÆ.
Oil ;

Koila-mukri, *Tel.*, Wrightia tomentosa, *Roem. & Scheult.*, APOCYNACEÆ.
Dye ;

Koir, *Ass.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Dye ; Tan ;

Koiral, *Beng.*, *Pb.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;

Kokama, *Bom.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;

Koki, *Tam.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Kokko, *Burm.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;

Koku, *Tam.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Kokum, *Bom.*, (Oil of) Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;

Kokum, Butter, *Eng.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;

Kola bogoti, *Nepal*, Baccaurea sapida, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Mordant ;

Kola mava, *Tam.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Oils ;

Kolan, *Gurhwal & Kumaun.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ;

Kolavu, *Tinnevelly*, Hardwickia pinnata, *Roxb.*, LEGUMINOSÆ.
Gum ;

Koli, *Kan.*, Bæcaurea sapida, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Mordant ;

Koliar, *Hind.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;

Koliar, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Kollu, *Tam.*, Dolichos biflorus, *Linn.*, LEGUMINOSÆ.
Oil ;
Konda, *Tel.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Oil ;
Konda-amadum, *Tel.*, Ballospermum montanum, *Mull. Arg.*, EUPHORBIACEÆ. Oils ;
Konda-kashinda, *Tel.*, Toddalia aculiata, *Pers.*, RUTACEÆ.
Dye ;
Kond tangedu, *Tel.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Gum ;
Konda vaghe, *Tam.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Khondha, *Hind.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Kone, *Tam.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Kong, *Tel.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;
Kongillam, *Tam.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Oil ;
Kongki, *Lepcha*, Prunus Puddum, *Roxb.*, ROSACEÆ.
Gum ;
Kongki, *Lepcha.*, Semecarpus Anacardium, *Linn.f.*, ANACARDIACEÆ.
Oil ;
Konkúdú, *Tel.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;
Kooail, *Nepal*, Sponia orientalis, *Planch.*, URTICACEÆ.
Koorák, *Bom.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ;
Koosúm, *Hind.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Gum ;
Kopar, *Hind.*, Dendrocalamus Hamilltonii, *Nees.*, GRAMINEÆ.
Fibre ;
Kopar, *Hind.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;
Kopasia, *Uryia*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;
Korala, *Mahr.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Kora-mau, *Tel.*, Breedeliaretusa, *Spreng.*, EUPHOREÆ.
Tan ;
Koranju, *Uryia*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Oil ;
Koray, *Tam.*, Cyperus rotunda, *Linn.*, CYPERACEÆ.
Dye ; Oil ;
Kor-ke-jhár, *Dec.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ; Oil ;
Korinta, *Tel.*, Acacia Intsia, *Willd.*, LEGUMINOSÆ.
Dye ;
Koriti, *Tel.*, Plecospermum spinosum, *Trecul*, URTICACEÆ.
Dye ;
Korna nebu, *Beng.*; Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Koroh, *Oudh*, Shoria robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;
Koroi, *Beng.* Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;
Kosa, *Hind.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;
Kosum, *Hind.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;

Kosundra, *Pb.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Kotamalli, *Tam.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;

Kothamira, *Mahr.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;

Kottai-pakka, *Tam.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ; Dye ; Fibre ;

Kovaryia, *Bom.*, Cassia Tora, *Linn.*, LEGUMINOSÆ.
Dye ;

Koal, *Lepcha*, Alnus nepalensis, *D. Don*, CUPULIFERÆ.
Dye ; Tan ; Oils ;

Kowal, *Lepcha*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;

Kowti, *Mar.*, Hydnocarpus Wightiana, *Blume*, BIXINEÆ.
Oil ;

Krim, *Lepcha*, Tabernæmontana coronaria, *Willd.*, APOCYNACEÆ.
Dye ;

Krishnatulsi, *Hind.*, *Beng.*, *Tel.*, Ocimum sanctum, *var.* sanctum, LABIATÆ. Oil ;

Kubinde, *Nepal*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;

Kuchandana, *Sans.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;

Kuchila, *Beng.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ; Oil ;

Kuchla, *Hind*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ; Oil ;

Kudu, **Kala**, *Mahr.*, Wrightia tinctoria, *B. Br.*, APOCYNACEÆ.
Gum ;

Kudaka, *Bom.*, Cedrela Toona, *Roxb*, MELIACEÆ.
Gum ; Dye ;

Kudoly, *Kan.*, Cicer arientinum, *Linn.*, LEGUMINOSÆ.
Dye ;

Kuja, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;

Kukar, *C. P.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Kukha-avalu, *Tel.*, Cleome viscosa, *Linn.*, CAPPARIDEÆ.
Oil ;

Kúlanjun, *Beng.*, Alpinia Galanga, *Sw.*, SCITAMINEÆ.
Dye ;

Kuki, *Kan.*, Baccaurea sapida, *Mull.*, EPHORBIACEÆ.
Dye ; Mordant ;

Kukto-pooi, *Beng.*, Basella cordifolia, *Lam.*, CHENOPODIACEÆ.
Dye ;

Kukurchita, *Beng.*, Tetranthera laurifolia, *Jacq.*, LAURACEÆ.
Oil ;

Kul, *Hind. Beng.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Dye ; Tan ;

Kulanjan, *Beng.*, Alpinia Galanga, *Sw.*, SCITAMINEÆ.
Dye ;

Kulinjan, *Hind.*, Alpinia Galanga, *Sw.*, SCITAMINEÆ.
Dye ;

Kulinjana, *Bom.*, Alpina Galanga, *Sw.*, SCITAMINEÆ.
Dye ;

Kulitba gaglip, *Sind.*, Dolichos biflorus, *Linn.*, LEGUMINOSÆ.
Oil ;

Kull-ponne, *Kan.*, Calophyllum Wightianum, *Wall*, GUTTIFERÆ.
Oil ;

Kulthi gahat, *Hind.*, Dolichos biflorus, *Linn.*, LEGUMINOSÆ.
Oil ;

Kulu, *Hind.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Kúmara, Konda, *Beng.*, *Hind.*, Cucurbita Pepo., *DC.*, CUCURBITACEÆ.
Oil ;
Kumbi, *Tam.*, Gardenia lucida, *Roxb.*, RUBIACEÆ.
Gum ;
Kumbi, *Hind.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ; Oil ;
Kumbi, *Hind.*, Careya arborea, *Roxb.*, BURSERACEÆ.
Gum ;
Kúmbúk, *Cingh.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Kumbuli, *Tam.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Kumhra, *Kumaun*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Kumila, *Hind.*, *Pb.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Kum-Jameva, *Beng.*, Styrax serrulatum, *Roxb.*, STYRACEÆ.
Gum ;
Kúmkuma, *Sans.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;
Kumkuma, *Tel.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Kumla nebu, *Beng.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Kumrá, *Beng.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Kumrá, *Beng.*, *Hind.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;
Kumta, *Raj*, Acacia Senegal, *Willd.*, LEGUMINOSÆ.
Gum ;
Kumveru, *Tel.*, Andropogon muricatus, *Retz.*, GRAMINEÆ.
Fibre ; Oils ;
Kun, *Burm.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ; Dye ; Fibre ;
Kundanuga, *Tel.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Kundi, *Sind.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ;
Kúndash, Pb., Alnus nitida, *Endl.*, BETULACEÆ.
Dye ; Tan ; Fibre ;
Kundur, *Arab.*, *Hind.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kunduru, *Sans.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kundur Madharaj, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kunduru, *Sans.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kundur Unsa, Boswellia, floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kundur Zakur, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Kungi, Bura, *Hind.*, *Beng.*, Abutilon graveolens, *W.* & *A.* MALVACEÆ.
Fibre ;
Kungli, *Tam.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Kungumapu, *Tam.*, Crocus sativus, *Linn*, IRIDACEÆ.
Dye ;
Kunhya, *Nepal*, Ficus Cunia, *Buch*, URTICACEÆ.
Fibre ;

Kuni Gum, *Eng.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ;

Kunia, *Kumaun*, Ficus Cunia, *Buch*, URTICACEÆ.
Fibre ;

Kunj, *Hind.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;

Kunjia, *Beng.*, Urena sinuata, *Linn.*, MALVACEÆ.
Fibre ;

Kunkhoora, *Ass.*, Bohmeria nivea., *H. & A.*, URTICACEÆ.
Fibre ;

Kuntheebin, *Burm.*, Areca Catechu, *Linn.*, PALMÆ.
Dye ;

Kuragumangjal, *Tam.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye ;

Kuraj, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ;

Kural, *Pb.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Kurang, *Simla*, Mardenia Roylei, *Wight.*, ASCLEPIADEÆ.
Fibre ;

Kuri, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;

Kurku, *Tam.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Fibre ;

Kurku corunga-maji, *Kan.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ. Oil ;

Kurkur kat, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;

Kurpá, *Tel.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;

Kurpa, *Bom.*, Memecylon edule, *Roxb.*, MELASTOMACEÆ.
Dye ;

Kurpoora maram, *Tam.*, *Mahr.*, Eucalyptus globulus, *Lam.*, MYRTACEÆ.
Gum ; Oil ;

Kurtam ussul, *Arab.*, GossyPium herbaceum, *Linn.*, MALVACEÆ.

Kurti-kalai, *Beng.*, Dolichos biflorus, *Linn.*, LEGUMINOSÆ.
Oil ;

Kúrúka, *Bomb.*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Kurumia, *Beng.*, Carisa Carandas, *Linn.*, APOCYNACEÆ.
Dye ; Tan ;

Kurwe-bádam, *Hind.*, *Bom.*, Prunus amygdalus, *Boill.*, ROSACEÆ.
Gum ; Oil ;

Kus, *Hind.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Kush, *Pb.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Gum ;

Kushaeta, *Kan.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;

Kushmul, *N.-W. P.*, Berberis Lycium, *Royle*, BERBERIDEÆ.
Gum ;

Kushumbá, *Tam.*, Carthamus tinctoria, *Linn.*, COMPOSITÆ.
Dye ;

Kusi, *Hind.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;

Kusimb, *Bomb.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;

Kúst, *Beng.*, *Hind.*, Costus Speciosus, *Sm.*, SCITAMINEÆ.
Oil ;

Kustui, *Tel.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ;

Kusum, *Beng. & Hind.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Gum ;
Kusum, *Hind.*, *Beng.*, *Dec.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ; Oil ;
Kusumb, *Hind.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Gum ;
Kusumba, *Bom.*, Carthamus tinctoria., *Linn.*, COMPOSITÆ.
Dye ;
Kutaki, *Tel.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;
Kuth, *Beng.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Dye ; Tan ;
Kutha, *Hind.*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan ;
Kutki, *Gond.*, Eriolæna Hookeriana, *W.* & *A.*, STERCULIACEÆ.
Fibre ;
Kutki, *Gond.*, Eriolæna spectabilis., *Planch.*, STERCULIACEÆ.
Fibre ;
Kutlanimbu, *Hind.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Kwam-thee-beng, *Burm.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ;
Kutri, *Pb.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;
Kwaytanyeng, *Burm.*, Pithecolobium dulce, *Benth.*, LEGUMINOSÆ.
Oil ;
Kwer, *Chenab*, Jasminum officinale, *Linn.*, OLEACEÆ.
Oil ;
Kyabaing, *Burm.*, Ceriops Roxburghiana, *Arnott.*, RHIZOPHOREÆ.
Dye ;
Kyaitha, *Burm.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;
Kyakatwa, *Burm.*, Bambusa arundinacea, *Retz.*, GRAMINEÆ.
Fibre ;
Kyam, *Tam.*, Ferula alliacea, *Boiss.*, UMBELLIFERÆ.
Gum ;
Kyat-thon-bega, *Burm.*, Allium sativum, *Linn.*, LILIACEÆ.
Oil ;
Kyaukchin, *Burm.*, Alum.
Mordant.
Kyauk-pa-yon, *Burm.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Kyellowa, *Burm.*, Bambusa Brandisii, *Munro*, GRAMINEÆ.
Fibre ;
Kyéni, *Burm*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;
Kyetpaung, *Burm.*, Wiceola elastica, *Roxb.*, APOCYNACEÆ.
Gum ;
Kyetsu, *Burm.*, Ricimus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Kyetsu, *Burm.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Kyetthwun-ni, *Burm.*, Allium cepa, *Linn.*, LILIACEÆ.
Oil ;
Kyetthwunbyu, *Burm.*, Allium sativum, *Linn*,, LILIACEÆ.
Oil ;
Kyinghi, *Lepcha*, Ponzalzia viminea, *Wedd.*, URTICACEÆ.
Fibre ;
Kyinki, *Lepcha*, Maoutia puaja, *Wedd*, URTICACEÆ.
Fibre ;
Kyu, *Burm.*, Terminalia citrina, *Roxb.*, COMBRETACEÆ.
Dye ;

Kyaungban, *Burm.*, Vitex trifolia, *Linn.*, VERBENACEÆ.
Oil ;

Kyoungha, *Burm.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Kyun, *Burm.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

L

Laber, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;

Laburnum, Indian, *Eng.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Lac, *Eng.*, Coccus Lacca.
Dye ;

Ladúri, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;

Lahan, *Raj.*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;

Laháṇabodara, *Bom.*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Lahokúng, *Lepcha*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Lai, *Hind.*, *Sind.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;

Laila, *N.-W. P.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Laj, *Pb.*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Oil ;

Lakhar, *Pb.*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Oil ;

Lakuch, *Hind.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Lakucha, *Sans.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Lala ambadi, *Sind.*, Hibiscus Sabdariffa, *Linn.*, MALVACEÆ.
Fibre ;

Lal-ambari, *Dec.*, *Hind.*, Hibiscus Sabdariffa, *Linn.*, MALVACEÆ.
Fibre ;

Lálachandana, *Bom.*, *Hind.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;

Lal-Bhopala, *Bom.*, Cucurbita maxima, *Duchesne*, CUCURBITACEÆ.
Oil ;

Lal-bherenda, *Beng.*, Jatropha glandulifera, *Roxb.*, EUPHORBIACEÆ.
Dye ; Oil ;

Lalchandan, *Hind.*, *Beng.*, Symplocos phyllocalyx, *Clerke*, STYRACEÆ.
Dye ;

Lal-dudiya, *Bom.*, Cucurbita marjima *Duchesne*, CUCURBITACEÆ.
Oil ;

Lal jhau, *Beng.*, Tamarix dioica, *Roxb.*, TAMARISCINEÆ.
Gum ; Dye ; Tan ;

Lallei, *Dec.*, Albizzia amara, *Boivin*, LEGUMINOSÆ.
Gum ;

Lal malata, *Nepal*, Macaranga indica, *Wight*, EUPHORBIACEÆ.
Gum ;

Lal-mugra, *Beng.*, Celosia cristata, *Linn.*, CHENOPODIACEÆ.
Fibre ;

Lancbar, *Trans-Indus*, Orthanthera viminea, *Wight*, ASCLEPIADEÆ.
Fibre ;

Landar, *Pb.*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Oil ;

Langshur, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;
Langura, *Bhutia*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Lanka, *Beng.*, *Hind.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;
Lanka-Sij, *Beng.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Lard.
Oil ;
Lard kunél, *Hind.*, Thevetia neriifolia, *Juss.*, APOCYNACEÆ.
Oil ;
Lari (root), Morinda citrifolia, *Linn.*, RUBIACEÆ.
Lasan, *Hind.*, Allium sativum, *Linn.*, LILIACEÆ.
Oils ;
Lasora, *Hind.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Lasuna, *Sans.*, *Mahr.*, Allium sativum, *Linn.*, LILIACEÆ.
Oils ;
Laswara, *Pb.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Latkan, *Hind.*, *Beng.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye ;
Latechu, *Ass.*, Baccaurea sapida, *Mull. Arg.*, EUPHORBIACEÆ.
Dye ; Mordant ;
Latikat, *Nep.*, Phyllanthus nepalensis, *Mull. Arg.*, EUPHORBIACEÆ.
Tan ;
Latjirá, *Hind.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;
Láu, *Beng.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Lauki, *Pb.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Laurel, Alexandrian, *Eng.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ;
Lavanga, *Beng.*, Caryophyllus aromaticus, *Linn.*, MYRTACEÆ.
Oil ;
Lavangala, *Tel.*, Caryophyllus aromaticus, *Linn.*, MYRTACEÆ.
Oil ;
Laynuag, *Manipur. See* Khaki.
Dye ;
Lebu, *Beng.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Lei, *Pb.*, Tamarix dioica, *Roxb.*, TAMARISCINEÆ.
Gum ; Dye ; Tan ;
Leinyu, *Pb.*, Tamarix articulata, *Vahl.*, T., dioca, *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;
Lemon, *Eng.*, Citrus medica, *Linn.*, var. Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;
Lesu, *Nepal*, Ficus elastica, *Bl.*, URTICACEÆ.
Gum ;
Lesuri, *Sind.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Letkop, *Burm.*, Sterculia fœtida, *Linn.*, STERCULIACEÆ.
Oil ;
Letpan, *Burm.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Lettopgyi, *Burm.*, Holarrhena antidysenterica, *Wall.*, APOCYNACEÆ.
Oil ;
Lettóp-thein, *Burm.*, Wrightia tomentosa, *Roem. & Scheult*, APOCYNACEÆ.
Dye ;

Lettuce, Common, *Eng.*, Lactuca Scariola, *Linn.*, COMPOSITÆ.
Oil ;

Liar, *Sind*, Cordia Rothii, *Roem. & Sch.*, BORAGINACEÆ.
Gum ;

Libidibi, *Bom.*, Cæsalpinia coriaria, *Willd.*, LEGUMINOSÆ.
Tan ;

Libu, *Beng.*, *Hind.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;

Lichen, Rose, *Eng.*, Parmelia kamtschadalis, *Esch.*, LICHENES.
Dye ;

Ligemotku, *Tel.*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Fibre ;

Lilac, Persian, *Eng.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Oil ;

Limbolee,——, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;

Limbu, *Hind.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;

Lime Tree of Europe, *Eng.*, Tilia europæa, *Linn.*, TILIACEÆ.
Fibre ;

Lime, Sour, *Eng.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;

Lime, Sweet, *Eng.*, Citrus medica, *Linn.*, var. Limetta, RUTACEÆ.
Gum ; Tan ; Oil ;

Lime, Wild, *Eng.*, Atalantia monophylla, *Corr.*, RUTACEÆ.
Oils ;

Limone, *It.*, Citrus medica, *Linn.*, var. Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;

Limonier, *Fr.*, Citrus medica, *Linn.*, var. Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;

Limoun, *Arab.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;

Limu, *Hind.*, *Arab.*, *Pers.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;

Linhe, *Burm.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oils ;

Lipiah, *Nepal*, Villebrunea appendiculata, *Wedd.*, URTICACEÆ.
Fibre ;

Lipic, *Nepal*, Villebrunea appendiculata, *Wedd.*, URTICACEÆ.
Fibre ;

Liquorice, *Eng.*, Glycyrhiza glabra, *Linn.*, LEGUMINOSÆ.
Dye ;

Litbora, *Hind.*, Litsœa zeylanica, *Nees*, LAURINEÆ.
Oil ;

Litchi, *Eng.*, Nephelium Litchii, *Camb.*, SAPINDACEÆ.
Gum ;

Lodh, *Kumaun*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Dye ; Oil ;

Lodh, *Hind.*, *Beng.*, Symplocos racemosa, *Roxb.*, STYRACEÆ.
Dye ; Tan ; Mordant ;

Lodh, *Hind.*, Symplocos spicata, *Roxb.*, STYRACEÆ.
Dye ;

Logwood, *Eng.*, Hæmatoxylon Campechianum, *Linn.*, LEGUMINOSÆ.
Dye ;

Lohar bhadi, *Beng.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Loja, *Sutlej*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Dye ; Oil ;

Lokandi, *Bom.*, Ventilago madraspatana, *Gaertn.*, RHAMNEÆ.
Gum ; Dye ; Fibre ;

Lonepho, *Burm.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;

Long, *Hind.*, Caryophyllus aromaticus, *Linn.*, MYRTACEÆ.
Oil ;
Losh, *Pb.*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Dye ; Oil ;
Lotus, *Eng.*, Nelumbium speciosum, *Willd.*, NYMPHÆACEÆ.
Fibre ;
Louz-ul-murr, *Arab.*, Prunus amygdalus, *Boill.*, ROSACEÆ.
Gum ; Oil ;
Lovage, *Eng.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
Lovi, *Dec.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;
Lowi, *Dec.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ;
Lú, *Pb.*, Symplocos crætagoides, *Ham.*, STYRACEÆ.
Dye ; Oil ;
Luban, *Arab.*, *Hind.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Luban, *Beng.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;
Luban meyeti, *Arab.*, Boswellia Frereana, *Birdw.*, BURSERACEÆ.
Gum ;
Luir, *Him. name*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;
Lukrabo-oil, *Siam*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Lulingyaw, *Burm.*, Cinnamomum zeylanicum, *Breyn.*, LAURINEÆ.
Dye ; Oil ;
Lullai, *Dec.*, Albizzia amara, *Boivin.*, LEGUMINOSÆ.
Gum ;
Lú-lándar, *Pb.*, Symplocos cratægoides, *Ham.*, STYRACEÆ.
Dye ;
Lunbo, *Burm.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Tan ;
Lust, *N.-W. P.*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Lutco, *Hind.*, Baccaurea sapida, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Mordant ;
Lut-ter, *Nepal*, Artocarpus Chaplasha, *Roxb.*, URTICACEÆ.
Gum ;

M

Maá, *Tam. Burm.* Magnifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;
Mace, *Eng.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;
Machi-patri, *Tel.*, Artemisia vulgaris, *Linn.*, COMPOSITÆ.
Oils ;
Máchi-pattiri, *Tam.*; Artemisia vulgaris, *Linn.*, COMPOSITÆ.
Oils ;
Machugan, *Garo*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Mada, *Tel.*, Avicinnia officinalis, *Linn.*, VERBENACEÆ.
Tan ;
Mada, *And.*, Ceriops Candolleana, *Arnott*, RHIZOPHOREÆ.
Tan ;
Madagari vembu, *Tel.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Madalaich-chedi, *Tam.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Madar, *Hind.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Madar, *Cachar*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Madat, *Mahr.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Madder, European, *Eng.*, Rubia tinctorium, *Linn.*, RUBIACEÆ.
Dye ;

Madder, Indian, *Eng.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;

Maddi, *Tel.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Maddi, *Mysore*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Madhuka, *Sans.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oils ;

Madhuka Sara, (oil) *Sans.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Oils ;

Madhurika, *Sans.*, Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;

Madu-karray, *Tam.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Maestapat, *Beng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;

Magadam, *Tam.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;

Magsher, *Pb.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Magyí, *Burm.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;

Mahahlegabyu, *Burm.;* Bauhinia acuminata, *Linn.*, LEGUMINOSÆ.
Oil ;

Mahahleganí, *Burm.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;

Mahalimbo, *C. P.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;

Maha limbu, *Uriya*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Mahálanga, *Bom.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;

Maha niebu, Citrus decumana, *Willd.*, RUTACEÆ.
Gum ;

Mahanim, *Hind.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Mahanimba, *Sans.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;

Maha rukh, *Hind.*, *Mahr.*, Ailanthus excelsa, *Roxb.*, SIMARUBEÆ.
Gum ;

Mahanshada, *Sans.*, Allium sativum, *Linn.*, LILIACEÆ.
Oils ;

Mahlbans, *Nepal.*, Bambusa nutans, *Wall.*, GRAMINEÆ.
Fibre ;

Mahlu, *Lepcha.*, Bambusa nutans, *Wall.*, GRAMINEÆ.
Fibre ;

Mahogany tree, Indian, *Eng.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Mahúá, *Hind.*, *Bom.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oils ;

Mahui, *Hind.*, Orthanthera viminia, *Wight.*, ASCLEPIADEÆ.
Fibre ;

Mahúla, *Beng.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oils ;

Mahwa, *Beng.*, *Hind.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;

Maida, *Pb.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;

Maidal, *Nepal.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Maidal-lara, *Nepal*, Plecospermum spinosum, *Trecul*, URTICACEÆ.
Dye ;

Maiden-hair, *Eng.*, Adiantum Cappilus-Veneris, *Linn.*, FILICES.
Oil ;

Mainakat lara, *Nepal*, Plecospermum spinosum, *Trecul*, URTICACEÆ.
Dye ;

Mainphal, *Hind.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Maize, *Eng.*, Zea Mays, *Linn.*, GRAMINEÆ.
Fibre ;

Majnún, *Pb.*, Salix babylonica, *Linn.*, SALICINÆ.
Fibre ;

Májtari, *Hind.*, Artemisia vulgaris, *Linn.*, COMPOSITÆ.
Oil ;

Majuphala, *Bom.*, Quercus infectoria, *Oliver*, CUPULIFERÆ.
Dye ;

Makanim, *Tel.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;

Makara-rai, *Hind.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Makar-limbu, *Mahr.*, Atalantia monophylla, *Corr.*, RUTACEÆ.
Oil ;

Makha-jowari, *Dec.*, Zea Mays, *Linn.*, GRAMINEÆ.
Fibre ;

Makhal, *Beng.*, Citrullus Colocynthis, *Schrad.*, CUCURBITACEÆ.
Oil ;

Makhmah, *Bom.*, Tagetes patula, *Linn.*, COMPOSITÆ.
Dye ;

Makhur, *Mahr.*, Atalantia monophylla, *Corr.*, RUTACEÆ.
Oil ;

Makka, *Hind.*, Zea Mays, *Linn.*, GRAMINEÆ.
Fibre :

Makka cholam, *Tam.*, Zea Mays, *Linn.*, GRAMINEÆ.
Fibre ;

Makka-zonalu, *Tel.*, Zea Mays, *Linn.*, GRAMINEÆ.
Fibre ;

Makkal, *Pb.*, Populus balsamifera, *Linn.*, SALICINEÆ.
Gum ;

Makki, *Tam.*, Garcinia Morella, *Desrouss.*, GUTTIFERÆ.
Gum ; Tan ;

Makkuna, *Hind.*, Bauhinia racemosa, *Lam* , LEGUMINOSÆ.
Gum ;

Makúlú, *Cingh.*, Hydnocarpus Wightiana, *Blume*, BIXINEÆ.
Oil ;

Makur-kendi, *Beng.*, *Hind.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;

Mala, *Hind.*, Spatholobus Roxburghii, *Bth.*, LEGUMINOSÆ.
Gum ;

Malabar,
Oil ;

Malagiri, *N.-W. P.*, See Hedychium spicatum, *Ham.*, SCTIAMINEÆ.
Dye ;

Ma-laing, *Burm.*, Broussonetia papyrifera, *Vent.*, URTICACEÆ.
Fibre ;

Malai-veppam, *Tam.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;

Malaka, *Burm.*, Psidium Guava, *Raddi*, MYRTACEÆ.
Dye ; Tan ;
Male, *Burm.*, Jasminum Sambac, *Aiton* , OLEACEÆ.
Oil ;
Malampongu, *Tinnevelly*, Garcinia travancorica, *Beddome*, GUTTIFERÆ.
Gum ;
Malghan, *Hind.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Máli, *Mahr.*, Pogostemon Patchouly, *Pollet.*, LABIATÆ.
Oil ;
Maljan, *Hind.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Malkakni, *Oudh*, *Kumaun*, Celastrus paniculatus, *Willd.*, CELASTRINEÆ.
Oil ;
Malkangni, *Pb.* (seeds of) Celastrus paniculatus, *Willd.*, CELASTRINEÆ.
Oil ;
Málkangoni, *Bom.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Mallanim, *C. P.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Mallai, *Salem*, Sansevieria zeylanica, *Willd.*, HÆMODORACEÆ.
Fibre ;
Mallai vembu, *Tam.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;
Mallow, Country, *Eng.*, Abutilon asiaticum, *G. Don*, MALVACEÆ.
Fibre ;
Mallow, Indian, *Eng.*, Abutilon avicennæ, *Gaertn.*, MALVACEÆ.
Fibre ;
Mallow-Musk, *Eng.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Malu, *Hind.*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Mamadi, *Tel.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;
Mamech, Polygonum bistorta, *Linn.*, POLYGONACEÆ.
Oil ;
Mamid, *Tel.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Oil ;
Manaloo oil.
Oil ;
Manche, *Tel.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Manchi-núne noovooloo, *Tel.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
anda, *Tel.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Manda dhup, *Kan.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;
Mándárá, *Bom.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Mándárá, *Bom.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Mandgay, *Bom.*, Bambusa arundinacea, *Retz.*, GRAMINEÆ.
Fibre ;
Mandkolla, *Pb.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Mangas, *Lam.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;
Manghati, *Uriya*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Mangil, *Tam.*, Bambusa arundianaceæ, *Retz.*, GRAMINEÆ.
Fibre ;

Mangi, *Salem.*, Sanseviria zeylanica, *Willd.*, HÆMODORACEÆ.
Fibre ;
Mango, *Eng.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;
Mangosteen, *Eng.*, Garcinia Mangostana, *Linn.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;
Mangrove, *Eng.*, Rhizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Tan ;
Mangrove Bark, Bruguiera gymnorrhiza, *Lam.* RHIZOPHOREÆ.
Tan ;
Mangrove, White, *Eng.*, Avicennia officinalis, *Linn.*, VERBENACEÆ.
Tan ;
Manipussupu, *Tel.*, Coscinium fenestratum, *Colebr.*, MENISPERMACEÆ.
Dye ;
Manjadi, *Kan.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ;
Manjal, *Tam.*, Curcuma longa, *Roxb.*, SCITAMINEÆ.
Dye ;
Manja-pa, *Tam.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;
Manjati, *Mal.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Oils ;
Manjistha, *Beng.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;
Manjit, *Hind.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;
Manjitti, *Tam.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;
Manjushta, *Kan.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;
Manneli, *Mal.*, Indigofera aspalathoides, *Vahl.*, LEGUMINOSÆ.
Oil ;
Mannoa, *see* Gossypium herbaceum, *L.*, var. herbaceum, MALVACEÆ.
Fibre ;
Mansa sij, *Beng.*, Euphorbia neriifolia, *Linn.*, EUPHORBIACEÆ.
Manu, *Pb.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;
Manyul, *Hind.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;
Maralingam, *Tam.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;
Maramunjil, *Tam.*, Coscinium fenestratum, *Colebr.*, MENISPERMACEÆ.
Dye ;
Marari, *Pb.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;
Maravetti, *Tam.*, Hydnocarpus Wightiana, *Blume*, BIXINEÆ.
Oil ;
Marda, *Hind.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;
Maredu, *Tel.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Marking-nut, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Margosa Tree, *Eng.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ; Oil ;
Marich Kala, *Beng.*, *Hind.*, Piper nigrum, *Linn.*, PIPERACEÆ.
Oil ;
Marigold, *Eng.*, Tagetes patula, *Linn.*, COMPOSITÆ.
Dye ;
Marithondi, *Tam.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Mark, *Pb.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;

Marlumulta, *Tam.*, Xanthium strumarium, *Linn.*, Compositæ.
Oil ;
Márni, *Hind.*, Sponia politoria, *Planch.*, Urticaceæ.
Fibre ;
Maror-phal, *Hind.*, Helicteres Isora, *Linn.*, Sterculiaceæ.
Fibre ;
Martan, *Hind.*, Desmodium tiliæfolium, *G. Don.*, Leguminosæ.
Fibre ;
Marti, *Sutlej*, Jasminum humile, *Linn.*, Oleaceæ.
Dye ;
Marul, *Tam.*, Sansevieria zeylanica, *Willd.*, Hæmodoraceæ.
Fibre
Marura, *Sans.*, Sansevieria zeylanica, *Willd.*, Hæmodoraceæ.
Fibre ;
Marvil, *Hind.*, Bauhinia racemosa, *Lam.*, Leguminosæ.
Fibre ;
Maseni, *Beng.*, Linum usitatissimum, *Linn.*, Lineæ.
Fibre ; Oil ;
Masina, *Beng.*, Linum usitatissimum, *Linn.*, Lineæ.
Fibre ; Oil ;
Maslúm, *Pb.*, Polygonum bistorta, *Linn.*, Polygonaceæ.
Oil ;
Massi, *Garhwal*, Nardostachys Jatamansi, *DC.*, Valerianaceæ.
Oil ;
Mastaki, Pistacia Cabulica, *Stocks.*, Piperaceæ.
Gum ;
Mastaru, *Beng.*, Artemisia vulgaris, *Linn.*, Compositæ.
Oils ;
Matau, *Burm.*, Garcinia Xanthochymus, *Hook. f.*, Guttiferæ.
Gum ;
Matayen, *Travancore*, Hardwickia pinnata, *Roxb.*, Leguminosæ.
Gum ;
Matela, *Beng.*, Bambusa Tulda *Roxb.*, Gramineæ.
Fibre ;
Mati-phal, *Tam.*, Ailanthus malabarica, *DC.*, Simarubeæ.
Gum ;
Mát-kalái, *Beng.*, Arachis hypogœa, *Linn.*, Leguminosæ.
Oils ;
Máti, Huldi—or Kai—*Beng.*, Ochre.
Matti, *Beas*, Orthanthera viminea, *Wight*, Asclepiadeæ.
Fibre ;
Maul, *Beng.*, Spatholobus Roxburghii, *Bth.*, Leguminosæ.
Gum ; Dye ; Tan ;
Maul, *C. P.*, Bauhinia Vahlii, *W. & A.*, Leguminosæ.
Fibre ;
Maul, *Beng.*, Bassia latifolia, *Roxb.*, Sapotaceæ.
Gum ; Dye ; Tan ; Oils ;
Maulser, *Hind.*, Mimusops Elengi, *Linn.*, Sapotaceæ.
Gum ; Dye ; Tan ; Oil ;
Maurain, *Hind.*, Bauhinia Vahlii, *W. & A.*, Leguminosæ.
Gum ;
Mauri, *Beng.*, Fœniculum vulgare, *Gaertn.*, Umbelliferæ.
Oil ;
Mausa, *Cingh.*, Laportea crenalata, *Gandich.*, Urticaceæ.
Fibre ;
Mawtda, *And.*, Heritiera littoralis, *Dryand.*, Sterculiaceæ.
Oil ;
May, *Tel.*, Schleichera trijuga, *Willd.*, Sapindaceæ.
Oil ;
Máyá, *Sind.*, Quercus infectoria, *Oliver*, Cupuliferæ.
Dye ;

Mayo-beng, *Burm.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Mazri, *Trans-Indian*, Chamærops Ritchecana, *Griff.*, PALMÆ.
Fibre ;
Mealum-ma, *Lepcha*, Laportea crenulata, *Gaudich.*, URTICACEÆ.
Fibre ;
Meda, *Pb.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Meda, *Hind.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;
Mee, *Cingh.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Meena-harma, *Bom.*, Balsamodendron playfairii, *Hook. f.*, BURSERACEÆ.
Gum ;
Mehndi, *Pb.*, Elsholtzia polystachya, *Benth.*, LABIATÆ.
Dye ; Oil ;
Mehndi, *Hind.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Meinkara, *Nepal*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;
Melon, Musk, *Eng.*, Cucurbita moschata, *Duchesne*, CUCURBITACEÆ.
Oil ;
Melon, Sweet, *Eng.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;
Melon, White, *Eng.*, Benincasa cerifera, *Savi*, CUCURBITACEÆ.
Oil ;
Menda, *Hind.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Mendah, *Gond.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;
Mendi, *Bom.*, *Beng.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Mengut, *Burm.*, Garcinia Mangostana, *Linn.*, GUTTIFERÆ.
Tan ;
Mentulu, *Tel.*, Trigonella Fœnum-græcum, *Linn.*, LEGUMINOSÆ.
Oil ;
Mesquit, *Eng.*, Prosopis glandulosa, *Torr.*, LEGUMINOSÆ.
Gum ;
Mesta, *Beng.*, Hibiscus sabdarifa, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Mestá-pát, *Beng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;
Mestapaut, *Beng.*, Hibiscus Cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Methi, *Hind.*, *Beng.*, Trigonella Fœnum-græcum, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Metunga, *Beng.*, Meocanna bambusoides, *Trim.*, GRAMINEÆ.
Fibre ;
Mhendi, *Hind.*, Lawsonia alba, *Lam.*, LYTHRACEÆ.
Dye ; Oil ;
Miah-sayelah, *Arab.*, Liquidamber orientalis, *Miller.*, HAMAMELIDEÆ.
Gum ;
Milagu, *Tam.*, Piper nigrum, *Linn.*, PIPERACEÆ.
Oils ;
Mil-karanai, *Tam.*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;
Milkisse, *Nepal*, Berberis nepalensis, *Spreng.*, BERBERIDEÆ.
Dye ;
Minbo, *Burm.*, Caryota urens, *Linn*, PALMÆ.
Fibre ;
Minbu, *Burm*, Garcinia mangostana, *Linn.*, GUTTIFERÆ.
Gum ;.

Mentulu, *Tel.*, Trigonella Fœnum-græcum, *Linn.*, LEGUMINOSÆ.
Dye ;

Mindla, *Pb.*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Mingut, *Mahr.*, Euphorbia neriifolia, *Linn.*, EUPHORBIACEÆ.
Gum ;

Mini, *Tam.*, Sponia orientalis, *Planch.*, URTICACEÆ.
Gum ;

Mi-ou-louke, *Burm.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Mipitmuk, *Lepcha*, Flemingia congesta, *Roxb.*, LEGUIMINOSÆ.
Dye ;

Mirandu, *Pb.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;

Miriya, *N.-W. P.*, Andropogon laniger, *Desf.*, GRAMINEÆ.

Miriyalu, *Tel.*, Piper nigrum, *Linn.*, PIPERACEÆ.
Oil ;

Mirri, *Chenab.*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Oil ;

Mishmist, *Pers*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Oil ;

Mithivan, *Pb.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Mocha, *Sans.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Tan ;

Mochras, Gum, Bombax malabaricum, *Sw.*, MELIACEÆ.
Gum ; Dye ; Fibre ;

Modala, *Ass.*, Macaranga indica, *Wight*, EUPHORBIACEÆ.
Gum ;

Modhuriam, *Ass.*, Psidium Guava, *Raddi*, MYRTACÆ.
Dye ; Tan ;

Modugu, *Tel.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ;

Modugu, *Tel.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Mogalieranda, *Bom*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;

Mográ, *Bom.*, Jasminum Sambac, *Aiton*, OLEACEÆ.
Oil ;

Mohanimba, *Sans.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ;

Mohi, *Uriya*, Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;

Mohin, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Moho, *Mahr.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ;

Mok, *Burm.*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;

Momchina, *Beng.*, Excæcaria sebifera, *Mull. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;

Mo-ma-kha, *Burm.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Monkey-bread tree of Africa, *Eng.*, Adansonia digitata, *Linn.*, MALVACEÆ. Fibre ;

Moula, *Burm.*, Raphanus sativus, *Linn.*, CRUCIFERÆ.
Oil ;

Mooda Hoora. *See* Dugong oil.
Oil ;

Moola, *Beng.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;

Moorgul mara, *Tam.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ; Oil ;

Mooroogana.
Oil ;

Mootoo, *Tam.*, Neeradimootoo Oil.
Oil ;

M ora, *Mahr.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Oil ;

Moradu, *Tam.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;

Mored, *Hind.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;

Moringi, *Nepal*, Laportea crenulata, *Gandich*, URTICACEÆ.
Fibre ;

Morli, *Tel.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;

Morunga, *Tam.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ; Oil ;

Motha, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;

Mova, *Bom.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ;

Mowa, *Hind.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oils ;

Mowa, *Trans-Indus*, Orthanthera viminea, *Wight*, ASCLEPIADEÆ.
Fibre ;

Mowa, *Hind.*, Phyllanthus nepalensis, *Müll. Arg.*, EUPHORBIACEÆ.
Tan ;

Mowen, *Hind.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Moya, *Bom.*, *Mahr.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Mucherus, (tan of) Bombax malabaricum, MALVACEÆ.
Tan ;

Muda-kaiyeya, *Cingh.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;

Mudarktai, *Beng.*, Cyperus tegetum, *Roxb.*, GRAMINEÆ.
Fibre ;

Mududad, *Tam.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;

Muduga. *See* Butea Frondosa, *Roxb.*, LEGUMINOSÆ.
Oil ;

Mugali, *Kan.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ;

Mugalik, *Tel.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;

Múgra, *Hind.*, *Beng.*, Jasminum Sambac, *Aiton*, OLEACEÆ.
Oil ;

Mugrela, *Beng.*, Nigella sativa, *Linn.*, RANUNCULACEÆ.

Mulsari, *Hind.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ;

Mujjum, *Bom.*, Casuarina equisetifolia, *Forst.*, CASUARINACEÆ.
Gum ; Tan ;

Mukki, *Tam.*, Garcinia Morella, *Decsr.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;

Mukta-jali, *Hind.*, Drosera peltata, *Sm.*, DROSERACEÆ.
Dye ;

Mukta-maya, *Uriya*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;

Mukta-pati, *Beng.*, Maranta dichotoma, *Wall.*, MARANTACEÆ.
Fibre ;

Mukul, *Hind.*, Balsamodendron Mukul, *Hook.*, BURSERACEÆ.
Gum ;
Mula, *Beng.*, Raphanus sativis, *Linn.*, CRUCIFERÆ.
Oil ;
Mulampandu, *Tel.*, Cucumis Melo, *L.*, CUCURBITACEÆ.
Oil ;
Mulathi, *Hind.*, Glycyrrhiza glabra, *Linn.*, LEGUMINOSÆ.
Dye ;
Mulberry, *Eng.*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Muli, *Beng.*, Melocanna bambusoides, *Trim.*, GRAMINEÆ.
Fibre ;
Muli, *Hind.*, Rephanus sativis, *Linn.*, CRUCIFERÆ.
Oil ;
Mulin, *Pb.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Mulluk-kerai, *Tam.*, Amarantus spinosus, *Willd.*, AMARANTACEÆ.
Dye ;
Mulsari, *Hind.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Mulu, *Hind.*, Spatholobus Roxburghii, *Benth.*, LEGUMINOSÆ.
Gum ;
Muluvelari, *Tam.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;
Muluvengay, *Tam.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Mundiri kottai, *Tam.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;
Munghphali, *Hind*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oils ;
Munj, *Eng.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Munja, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Munja pavattary, *Tam.*, Morinda citrifolia, *Linn.*, var citrefolia, RUBIACEÆ. Dye ;
Munj-sar-kanda, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Munnoah. *See* Gossypium herbaceum, L., var. herbaceum, MALVACEÆ.
Fibre ;
Murahara, *Beng.*, Sansevieria zeylanica, *Willd.*, HŒMADORACEÆ.
Fibre ;
Murba, *Beng.*, Sansevieria zeylanica, *Willd.*, HŒMADORACEÆ.
Fibre ;
Murgali, *Dec.*, Sansevieria zeylanica, *Willd.*, HŒMADORACEÆ.
Fibre ;
Murgli, *Beng.*, Sansevieria zeylanica, *Willd.*, HŒMADORACEÆ.
Fibre ;
Muriá, *Garhwal*, Buchanania latifolia, *Roxb.*, LEGUMINOSÆ..
Gum ; Tan ;
Murkula, *Hind.*, Marsdenia Roylei, *Wight.*, ASCLEPIADEÆ.
Fibre ;
Murt, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;
Murudasenga, *Bom.*, (fruit of) Helicteres Issora, *Linn.*, STERCULIACEÆ.
Fibre ;
Muruka, *Tam.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Murungana.
Oil ;
Murute, *Cingh.*, Lagerstræmia Flos-Reginæ, *Rets.*, LYTHRACEÆ.
Gum ;

Murwa. See Gossypium Herbaceum, *L.*, var. herbaceum, MALVACEÆ.
Fibre ;
Musadi, *Tel.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ; Oil ;
Musánbár, *Dec*, Aloe vera, *Linn.*, LILIACEÆ.
Dye ; Fibre ;
Mushambáram, *Tel.*, Aloe vera *Linn.*, LILIACEÆ.
Dye ; Fibre ;
Mushk-bhendi-ke-binj, *Dec.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre. ;
Mushk-dana, *Pers.*, Hibiscus Abelmoschus, *Linn.*, MALVACEÆ.
Fibre ;
Mushti, *Tel.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ; Oil ;
Musta, *Sans.*, *Bom.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ;
Mustard, Black or True, *Eng.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Mustard, Indian, *Eng.*, Brassica juncea, *H. F. & T. T.*, CRUCIFERÆ.
Oil ;
Mustard, White, *Eng.*, Brassica alba, *H. f.* & *T. T.*, CRUCIFERÆ.
Oil ;
Mustard, Wild, *Eng.*, Cleome viscosa, *Linn.*, CAPPARIDÆ.
Oil ;
Mustic, *Eng.*, Maclura tinctoria, *D. Don.*, URTICACEÆ.
Dye ;
Mutagu, *Kan.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ;
Muthá, *Beng.*, *Hind.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ; Oil ;
Muthá, Nágur, *Beng.*, Cyperus pertenuis, *Roxb.*, CYPERACEÆ.
Dye ;
Muttava, *Hind.*, Sida cordifolia, *Linn.*, MALVACEÆ.
Fibre ;
Muttugu, *Kan.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Myauk-si, *Burm.*, Zizyphus rugosa, *Lamk.*, RHAMNEÆ.
Gum ;
Myatle, *Burm.*, Jasminum grandiflorum, *Linn.*, OLEACEÆ.
Oil ;
Myauklot, *Burm.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Dye ;
Myeng, *Burm.*, Cynomera ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Myenkapen, *Burm.*, Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ;
Myinwa, *Burm.*, Dendrocalamus strictus, *Nees*, GRAMINEÆ.
Fibre ;
Myinwa, *Burm.*, Dendrocalamus Hamiltonii, *Nees*, GRAMINEÆ.
Fibre ;
Myjinka, *Burm.*, Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ;
Myoosay, *Bhutia*, Thamnocalamus spathiflorus, *Munro*, GRAMINEÆ.
Fibre ;
Myouklouk, *Burm.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ;
Myaukseit, *Burm.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Myepe, *Burm.*, Arachis hypogæa, *Linn.*, LEGUMINOSÆ.
Oil ;
Myrosyne, *Eng. See* Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Myroxcic acid, *Eng.*, Brasssica nigra, *Koch.*, CRUCIFEEÆ.
Oil ;
Myrrh, *Eng.*, Balsamodendron Myrrha, *Nees*, BURSERACEÆ.
Gum ;

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Nabátulqunnah, *Arab*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre ; Oil ;
Nabe, *Burm.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Dye ;
Nabhay, *Burm.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Nagraem rik, *Lepcha*, Acacia Intsia, *Willd.*, LEGUMINOSÆ.
Dye ;
Naga, *Tam.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Nágachampá, *Bom.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Oil ;
Nagadali, *Tam.*, Opuntia Dillenii, *How.*, CACTEÆ.
Fibre ;
Nágakésara, *Tel.*, Mesua ferra, *Linn.*, GUTTIFERÆ.
Oil ;
Nágakundá, *Bom.*, Morinda citrifolia., *Linn.*, var. bracteata, RUBIACEÆ.
Dye ;
Nágaramothá, *Bom.*, Cyperus pertenuis, *Roxb.*, CYPERACEÆ.
Dye ;
Nagesar, *Hind.*, *Beng.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Dye ; Oil ;
Nagphana, *Hind.*, Opuntia Dillenii, *How.*, CACTEÆ.
Fibre ;
Nagphansi, *Hind.*, Opuntia Dillenü, *How.*, CACTEÆ.
Fibre ;
Nagpút, *Sylhet*, Bauhinia anguina, *Roxb.*, LEGUMINOSÆ.
Fibre ;
Nagraem rik, *Lepcha*, Acacia Intsia, *Willd.*, LEGUMINOSEÆ.
Dye ;
Naha, *Cingh.*, Lasiosiphon ericephalus, *Decne.*, URTICACEÆ.
Fibre ;
Nahar, *Ass.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Dye ; Oil ;
Nairuri, *Tel.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Naiwilli, *Nepal*, Bauhinia anguina, *Roxb.*, LEGUMINOSÆ.
Fibre ;
Nai-yurur, *Tam.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;
Nakhtar, *Afg.*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Gum ; Oil ;
Nakhtar, *Afg.*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;
Nal, *Beng.*, Arundo Karka, *Roxb.*, GRAMINEÆ.
Fibre ;
Nala-rojan, *Tel.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;
Nala sandra, *Tel.*, Acacia Sundra, *DC.*, LEGUMINOSÆ.
Gum ;
Nalkhud, *Pers.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;
Nalki, *Beng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ
Fibre ;

Nalku, *Beng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Nalla-mada, *Tel.*, Avecinnia officinalis, *Linn.*, VERBENACEÆ.
Tan ;
Nalla-tiga, *Tel.*, Ichnocarpus frutescens, *Br.*, APOCYNACEÆ.
Fibre ;
Nallarenga, *Tel.*, Albizzia amara, *Boivin*, LEGUMINOSÆ.
Gum ;
Nal lenney, *Tam.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Nal valanga, *Tam.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Namli, *Tel.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Namme, *Tam.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Nandi, *Tel.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;
Nangal, *Tam.*, Mesua ferrea, *Linn.*, GUTTIFERÆ.
Dye ; Oil ;
Nanjunda, *Tam.*, Balanites Roxburghii, *Planch.*, SIMARUBEÆ.
Oils ;
Nanta-yop, *Burm.*, Altingia excelsa, *Noronha*, HAMALIDEÆ.
Gum ;
Nan nan, *Burm.*, Coriandrum sativum, *Linn.*, UMBELLIFERÆ.
Oil ;
Nann-with, *Sylhet*, Gnetum scandens, *Roxb.*, GNETACEÆ.
Fibre ;
Nar, *Beng.*, Arundo Kirka, *Roxb.*, GRAMINEÆ.
Fibre ;
Narangi, *Hind.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Nar-botku, *Tel.*. Eriolæna Hookeriana, *W. & A.*, STERCULIACEÆ.
Fibre ;
Nar-botku, *Tel.*, Eriolæna spectabilis, *Planch.*, STERCULIACEÆ.
Fibre ;
Narial, *Hind.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Nari kadam, *Tel.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Narikel, *Beng.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Naringi, *Hind.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Narlei, *Pb.*, Tamarix articulata, *Vahl.*, TAMARISCINEÆ.
Gum ;
Narockpa, *Lepcha*, Canarium bengalense, *Roxb.*, BURSERACEÆ.
Gum ;
Narra alagi, *Tel.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Narvilli, *Tam.*, Cordia Rothii, *Röem. & Sch.*, BORAGINEÆ.
Gum ;
Narum-panel, *Mal.*, Uvaria Narum, *Wall.*, ANONACEÆ.
Oil ;
Nar yepi, *Tel.*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Nasedu, *Tel.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Nasha, *Burm.*, Phyllanthus Emblicus, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Nata, *Beng.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;

Natian, *Hind.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Nattu-akrottu-kottai, *Tam.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oils ;
Natu-akrotu-vittu, *Tel.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oils ;
Natu sengote, *Tam.*, Semecarpus travancorica, *Bedd.*, ANACARDIACÆ.
Gum ;
Natvadom, *Tam.*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Dye ; Oil ;
Naug, *Hind.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;
Naval, *Tam.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;
Nay-kadughu, *Tam.*, Cleome viscosa, *Linn.*, CAPPERIDEÆ.
Oil ;
Nay-wé, *Burm.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;
Nebu, *Beng.*, *Hind.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;
Nebu, Korna, *Beng.*, Citrus medica, *Linn.*, var. Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;
Nebu, Mitha, *Beng.*, Cetrus medica, *Linn.*, var. Limetta, RUTACEÆ.
Gum ; Tan ; Oil ;
Neela-vayalie, *Tel.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Neem Tree, *Eng.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ;
Neeradimootoo.
Oil ;
Neernoochie, *Tam.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Neesberry, *Eng.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Neja, *Him. name*, Saccharum fuscum, *Roxb.*, GRAMINEÆ.
Fibre ;
Nela-amida, *Tel.*, Jatrophya glandulifera, *Roxb.*, EUPHORBIACEÆ.
Dye ; Oil ;
Nella-benda, *Tam.*, Hibiscus ficulneus, *Linn.*, MALVACEÆ.
Fibre ;
Nella-jelledu, *Tel.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Nella-madu, *Tel.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Nella-túma, *Tel.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;
Nellikai, *Tam.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Nelli, *Tam.*, *Kan.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Nepala-vitua, *Tel.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;
Nepalam, *Tel.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;
Neri-arishippal, *Tam.*, Liquidamber orientalis, *Miller.*, HAMAMELIDEÆ.
Gum ;
Nerrelu, *Cingh.*, Elæodendron glaucum, *Pers.*, CELASTTINÆ.
Gum ;
Nervalam, *Tam.*, Croton Tiglium, *Linn.*, EUPHORBIACEÆ.
Oil ;
Neroli. See Citrus.
Oil ;

Nettle, Nilgiri, *Eng.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Nevadunga, *Mahr.*, Euphorbia neriifolia, *Linn.*, EUPHORBIACEÆ.
Gum ;
Ngetpyaw, *Burm.*, Musa paradisiaca, *Linn.*, SCITAMINEÆ.
Dye ;
Ngushwe, *Burm.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Tan ;
Niala, *Pb.*, Polygonum tortuosum, *Don.*, POLYGONACEÆ.
Dye ;
Nialo, *Pb.*, Polygonum tortuosum, *Don.*, POLYGONACEÆ.
Dye ;
Niatoo, *Malay*, Dichopsis Gutta, *Benth. & Hook. f.*, SAPOTACEÆ.
Oil ;
Nibari, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;
Nigal, *Hind.*, Arundinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;
Nigandbabri, *Pb.*, Ocimum Basilicum, *Linn.*, var. 2nd anisatum, *Benth.*, LABIATÆ. Oil ;
Niger (seed and oil,) *Eng.*, Guizotia abyssynica, *Cass.*, COMPOSITÆ.
Oil ;
Niggi, *Pb.*, Daphne papyracea, *Wall.*, THYMELÆACEÆ.
Fibre ;
Nikumba, *Sans.*, Jatropha glandulifera, *Roxb.*, EUPHORBIACEÆ.
Dye ; Oil ;
Nil, *Hind.*, Indigofera tinctoria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Nila gula, *Bom.*, Indigofera tinctoria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Nilam, *Tam.*, Indigofera tinctoria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Nili-mandu, *Tel.*, Indigofera tinctoria, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;
Nilophar, *Sind.*, Nilumbium speciosum, *Willd.*, NYMPHŒACEÆ.
Fibre ;
Nim, *Beng.*, *Hind.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ; Oil ;
Nim tree, *Eng.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Oil ;
Nimat, *Lepcha*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Nimba, *Sans.*, Melia Azadirachta, *Linn.*, MALVACEÆ.
Oil ;
Nimbu, *Beng.*, *Hind.*, Citrus medica, *Linn.*, var. acida, RUTACEÆ.
Gum ; Tan ; Oil ;
Nimbe hanu, *Kan.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ; Oil ;
Nimbu, Bara, *Hind.*, Citrus medica, *Linn.*, var. Limonum, RUTACEÆ.
Gum ; Tan ; Oil ;
Nimiri, *Tel.*, Terminalia paniculata, *W. & A.*, COMBRETACEÆ.
Dye ; Tan ;
Nimma-pandu, *Tel.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ;
Nirangi, *Kan.*, Poinciana elata, *Linn.*, LEGUMINOSÆ.
Gum ;
Nirelli, *Tel.*, Allium cepa, *Linn.*, LILIACEÆ.
Oils ;
Nirgal, *Hind.*, Arundinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;
Nirija, *Tel.*, Elæodendron glaucum, *Pers.*, CELASTRINEÆ.
Gum ;

Nirnochi, *Tam.*, Vitex trifolia, *Linn.*, VERBENACEÆ.
Oil ;
Nirpa, *Tel. & Gondi*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;
Nisádal, *Beng.*, Sal-ammoniac.
Dye ;
Nishinda, *Beng.*, Vitex trifolia, *Linn.*, VERBENACEÆ.
Oil ;
Nishinda, *Beng.*, Vitex Nigundo, *Linn.*, VERBENACEÆ.
Dye ;
Nona, *Beng.*, Anona reticulata, *Linn.*, ANONACEÆ.
Dye ; Fibre ;
Noonee-gatcha, *Tel.*, Cæsalpinia digyna, *Rol.*, LEGUMINOSÆ.
Oil ;
Nuch, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;
Nu danar, *Hind.*, Arundo Karka, *Roxb.*, GRAMINEÆ.
Fibre ;
Nugubenda, *Tel.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Nulla-gilakara, *Tel.*, Nigella sativa, *Linn.*, RANUNCULACEÆ.
Oil ;
Numma, *Tam.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;
Nundo-jangro, *Sind.*, Zizyphus nummularia, *W. & A.*, RHAMNEÆ.
Gum ;
Nun, *Ass.*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Nuni-beerd, *Tel.*, Luffa ægyptiaca, *Mill. ex Hook f.*, CUCURBITACEÆ.
Oil ;
Nurku, *Pb.*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Gum ;
Nurmah, see Gossypium arboreum, *L.*, MALVACEÆ.
Fibre ;
Nurma-bare, Gossypium arboreum, *L.*, MALVACEÆ.
Fibre ;
Nutmeg, *Eng.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;
Nut, Pistachio, *Eng.*, Pistacia vera, *Linn.*, ANACARDIACEÆ.
Oil ;
Nyaung, *Burm.*, Ficus laccifera, *Roxb.*, URTICACEÆ.
Gum ;
Nyaungbawdi, *Burm.*, Ficus elastica, *Blume.*, URTICACEÆ.
Gum ;
Nyaunggyat, *Burm.*, Ficus obtusifolia, *Roxb.*, URTICACEÆ.
Gum ;
Nyoungchin, *Burm.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Fibre ;

O

Ochro, *West Indies*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;
Odla, *Ass.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Odul, Sarcostigma Kleinii, *W. & A.*, OLACINEÆ.
Oil ;
Oe, *Pb.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;
Oepata, *Mal.*, Avicinnia officinalis, *Linn.*, VERBENACEÆ.
Tan ;

Oi, *Pb.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;
Okshit, *Burm.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Olá cháhá, *Bom.*, Andropogon citratus, *DC.*, GRAMINEÆ.
Oil ;
Olchi, *Pb.*,Prunus communis, *Huds.*, ROSACEÆ.
Gum ; Oil ;
Olchi, *Pb.*, Prunus Cerasus, *Linn.*, ROSACEÆ.
Gum ;
Oleander, *See* Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;
Oleander, Sweetly Scented, *Eng.*, Nerium odorum, *Soland.*, APOCYNACEÆ.
Oil ;
Olibanum, *Eng.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Olive, *Eng.*, Olea europæa, *Linn.*, OLEACEÆ.
Oman, *Tam.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
Omanu, *Tel.*, Carum copticum, *Benth.*, UMBELLIFERÆ.
Oil ;
On, *Burm.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Ondon, *Burm.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Ondon, *Burm.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;
Onion, *Eng.*, Allium cepa, *Linn.*, LILIACEÆ.
Oils ;
Opie, *Tam.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;
Otrum, *Dec.*, Daemia extensa, *R. Br.*, ASCLEPIADEÆ.
Fibre ;
Ora, *Beng.*, Bambusa Brandisii, *Munro*, GRAMINEÆ.
Fibre ;
Orange, *Eng.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Orange-flower. *See* Citrus.
Oil ;
Orer, *Nepal*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Oris Root, *Eng.*, Iris florentina, *Linn.*, IRIDACEÆ.
Oil ;
Orris oil. *See* Iris.
Oil ;
Oru, *Beng.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Osirka, *Tel.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Gum ; Dye ; Tan ;
Otroj, *Arab*, Citrus medica, *Linn.*, var. medica, RUTACEÆ.
Gum ; Tan ; Oil ;
Oug, *Burm.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ;
Ovali, *Bom.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;

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Paán, *Pb.*, Rhus cotinus, *Linn.*, ANACARDIACEÆ.
Dye; Tan ;
Pabha, *Bom.*, Chickrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;

Pabuna, *Hind.*, Ulmus Wallichiana, *Planch.*, URTICACEÆ.
Fibre ;

Pachapat, *Beng.*, Pogostemon Patchouly, *Pelht.*, LABIATÆ.
Oil ;

Pachat, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ.

Pachi mánu, *Tel.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;

Pachmer, (root of) Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;

Padal, *Hind.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ;

Padala-manu, *Tel.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Padam, *N. W. P.*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;

Paddam, *Hind.*, Prunus puddum, *Roxb.*, ROSACEÆ.
Gum ;

Padenarayan, *Tam.*, Poinciana elata, *Linn.*, LEGUMINOSÆ.
Gum ;

Padialu, *Hind.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ;

Padma-kaesta, *Bom.*, Prumus Puddum, *Roxb.*, ROSACEÆ.
Gum ;

Padma, *Beng.*, Nelumbium speciosum, *Willd.*, NYMPHŒACEÆ.
Fibre ;

Padri, *Tam.*, Stereospermum suaveolens, *DC.*, MYRTACEÆ.
Gum ;

Padrián, *Hind.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Pagun, *Hind.*, *Beng.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Oil ;

Pailæ, *Tam.*, Careya arborea, *Roxb.*, MYRTACEÆ.
Gum ;

Paira, *Oudh.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;

Pakar, *Beng.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Gum ;

Pakara, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Oil ;

Pakhar, *Hind.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Gum ;

Pakituma, *Tel.*, Acacia Latronum, *Willd.*, LEGUMINOSÆ.
Fibre ;

Pakur, *Hind.*, *Beng.*, Ficus infectoria, *Willd.*, URTICACEÆ.
Fibre ;

Pakúra, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;

Pala, *Tam.*, Wrightia tinctoria, *B. Br.*, APOCYNACEÆ.
Gum ; Dye ;

Pala, *Burm.*, Amomum subulatum, *Roxb.*, SCITAMINEÆ.
Oil ;

Pala-chettu, *Tel.*, Holarrhena antidysenterica, *Wall.*, APOCYNEÆ.
Oil ;

Palagurgi, *Tel.*, Holostemma rheedei, *Wall.*, ASCLEPIADACEÆ.
Fibre ;

Palah-maram, *Tel.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Palándu, *Sans.*, Allium cepa, *Linn.*, LILIACEÆ.
Oils ;

Palás, *Hind. & Beng.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ; Oil ;

Palása, *Mahr.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Fibre ;

Pála-samudra, *Tel.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oil ;

Palasavela, *Bom.*, *Mahr.*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Palash, *Beng.*, Butia frondosa, *Roxb.*, LEGUMINOSÆ.
Fibre ;

Palasi, *Nepal.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Palasi, *Bom.*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Palita mandar, *Beng.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Pal kurwan, *Uríya*, Wrightia tomentosa,*Roem. and Scheult.*, APOCYNACEÆ.
Dye ;

Palla, *Tam.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Palla pandu, *Tel.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Oil ;

Palle panlo, *Tel.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ;

Pallu, *Pb.*, Impatiens Edgeworthii, *Hook.*, GERANIACEÆ.
Oil ;

Pallutilphár, *Pb.*, Impatiens balsamina, *Linn.*, GERANIACEÆ.
Dye ;

Palm, Palmyra, *Eng.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Fibre ;

Palm, Talipat, *Eng.*, Corypha umbraculifera, *Linn.*, PALMÆ.
Fibre ;

Palma,Christi, *Eng.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;

Palok, *Lepcha*, Ostodes paniculata, *Blume*, EUPHORBIACEÆ.
Gum ;

Palosa, *Afg.*, Acacia modesta, *Wall.*, LEGUMINOSÆ.
Gum ;

Palú, *Cingh.*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Palúdar, *Him. name*, Abies Webbiana, *Lindl.*, CONIFERÆ.
Gum ;

Palúdar, *Hazara*, Cedrus Deodara, *Loudon*, CONIFERÆ.
Oil ;

Paluk, *Hind.*, Spinacia oleracea, *Mill.*, CHENOPODIACEÆ.
Oil ;

Palungú, *Tam.*, Hibiscus cannabinus, *Linn*, MALVACEÆ.
Fibre ; Oil ;

Palyok, *Lepcha*, Symplocos racemosa, *Roxb.*, STYRACEÆ.
Dye ; Tan ; Mordant ;

Pamania, *Tel.*, Croxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Pambah, *Pers.*, Gossypium herbaceum, *Linn.*, MALVACEÆ.
Fibre ;

Pambash, *Pb.*, *Afg.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Pampana, *Tel.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Pán, *See* Areca Catechu, *Linn.*, PALMÆ.
Dye ;

Pan, *Pb.*, Typha elephantina, *Roxb.*, TYPHACEÆ.
Fibre ;

Pan, *Burm.*, Crotalaria juncea, *Linn.*, LEGUMINOSÆ.
Fibre ;

Pana, *Tam.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Panam, *Tam.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;

Panan, *Oudh*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;

Panas, *Hind.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Panasa, *Sans.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Pan-babiyo, *N.-W.P.*, Eriophorum comosum, *Wall.*, CYPERACEÆ.
Fibre ;

Panchi, *Uriya*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;

Panchonta, *Kan.*, Dichopsis elliptica, *Benth.*, SAPOTACEÆ.
Oil ;

Panchoti-pala, *Tam.*, Dichopsis elliptica, *Benth.*, SAPOTACEÆ.
Oil ;

Pándhri visesh, *Bom.*, Boswellia Frereana, *Birdw.*, BURSERACEÆ.
Gum ;

Panda, *Pb.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;

Pándrúka, *Mahr.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ; Fibre ;

Panenuhorí, *Beng*, Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;

Pangah, *Burm.*, Terminalia Chebula, *Kets.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Pángárá, *Bom.*, *Mahr.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Pangra, *Nepal.*, Entada scandens, *Benth.*, LEGUMINOSÆ.
Oil ;

Pangra, *Hind.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Paniala, *Beng.*, *Hind.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;

Panichika, *Tam.*, Dyspyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ;

Pani jama, *Beng.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Panizali, *Beng.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;

Panji, *Lepcha*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Panjira, *Hind.*, Erythrina indica, *Lam.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Pank, *Burm.*, Æschynomene aspera, *Linn.*, LEGUMINOSÆ.
Fibre ;

Pala, *Burm.*, Elettaria Cardamomum, *Maton.*, SCITAMINEÆ.
Oil ;

Panniarí, *Hind.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;

Pannie, *Tam.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;

Pansi, *Tel.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;

Panyaung, *Burm.*, Ficus bengalensis, *Linn.*, URTICACEÆ.
Gum ;

Papanasa, *Bom.*, Citrus decumana, *Willd.*, RUTACEÆ.
Gum ;

Papar, *Hind.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;

Papar, *Kumaun*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Papashkali, *Kan.*, Opuntia Dillenii, *How.*, CACTEÆ.
Fibre ;
Papli, *Tam.*, Ventilago madraspatana, *Gærtn.*, RHAMNEÆ.
Gum ; Dye ; Fibre ;
Papri, *Pb.*, *Hind.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Paral, *Hind.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ;
Parangi-shambiriani, *Tam.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Parari, *Nepal.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ; Fibre ;
Paras, *Mahr.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tam ;
Paras, *Pb.*, Prunus Padus, *Linn.*, ROSACEÆ.
Gum ;
Parasa, *Tam.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ; Oil ;
Parash, *Beng.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Paresh-pipal, *Beng.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Páriátjaka, *Bom.*, Nictanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;
Paritt, *Tell.*, Gossypium arboreum, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Párkánda, *Bom.*, Agave americana, *Linn.*, AMARYLLIDEÆ.
Fibre ;
Parokupi, *Ass.*, Croton oblongifolius, *Roxb.*, EUPHORBIACEÆ.
Oil ;
Parosí, *Bom.*, Luffa ægyptiaca, *Mill.*, *ex Hook f.*, CUCURBITACEÆ.
Oil ;
Parpalli, *Kan.*, Zizyphus nummularia, *W. & A.*, RHAMNEÆ.
Gum ;
Parshawarsha, *Pb.*, Adiantum Cappilus Veneris, *Linn.*, FILICES.
Oils ;
Parsid, *Singrowli*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Parsipu, *Hind.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Parul, *Beng.*, Stereospermum suaveolens, *DC.*, BIGNONIACEÆ.
Gum ;
Parula, *Mahr.*, Trichosanthes cucumerina, *Linn.*, CUCURBITACEÆ.
Gum ;
Parupu-benda, *Tam.*, Hibiscus ficulneus, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Parutti, *Tam.*, Gossypium arboreum, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Páser, *Pb.*, Parrotia Jacquemontiana, *Decaisne.*, HAMAMELIDEÆ.
Fibre ;
Pashi, *Tel.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;
Pasi, *Uriya*, Anogeissus acuminata., *Wall.*, COMBRETACEÆ.
Tan ;
Pasi, *Mahr.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Pastuwanne, *Afg.*, Grewia oppositifolia, *Roxb.*, MALVACEÆ.
Fibre ;
Pasupa, *Tel.*, Curcuma longa., *Roxb.*, SCITAMINEÆ.
Dye ;

Pát, *Eng.*, *Beng.*, Carchorus olitorius, *Linn.*, and C. capsularis, *Linn.* TILIACEÆ.
Fibre ;

Pát-anga, *Tam.*, *Bom.*, Cæsalpinia Sappan., *Linn.*, LEGUMINOSÆ.
Dye ;

Patchalai, *Tam.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum;

Patchouli, *Eng.*, Pogostemon Patchouly, *Pellet.*, LABIATÆ.
Oil ;

Patenga, *Tel.*, Briedelia montana, *Willd.*, EUPHORBIACEÆ.
Tan ;

Pat-hoo, *Nepal.*, Arundinaria racemosa, *Munro.*, GRAMINEÆ.
Fibre ;

Pathor, *Pb.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;

Pathor, *Chenab.*, Marsdenia Roylei, *Wight.*, ASCLEPIADEÆ.
Fibre ;

Pati, *Beng.*, Maranta dichotoma, *Wall.*, SCITAMINEÆ.
Fibre ;

Pati-hori, *Beng.*, Saccharum fuscum, *Roxb.*, GRAMINEÆ.
Fibre ;

Pati-káram, *Tam.*, *Tel.*, Alum.
Mordant ;

Pati-pati, *Beng.*, Maranta dichotoma, *Wall.*, SCITAMINEÆ.
Fibre ;

Patir, *Tel.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ;

Pativa, *Uriya*, Randia dumetorum, *Lam.*, RUBIACEÆ.
Dye ;

Patmoro, *Nepal.*, Cornus macrophylla, *Wall.*, CORNACEÆ.
Oil ;

Pat-phanas, *Mahr.*, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;

Patsar, *Dec.*, *Hind.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;

Patu, *Beng.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;

Patur, *Hind.*, Hymenodictyon excelsum, *Wall*, RUBIACEÆ.
Tan ;

Patwa, *Dec.*, *Hind.*, Hibiscus Sabdariffa, *Linn.*, MALVACEÆ.
Fibre ;

Paunchoti pala, *Tam.*, Dichopsis elliptica, *Benth.*, SAPOTACEÆ
Gum ;

Pauk, *Burm.* Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Pauknwé, *Burm.*, Spatholobus Roxburghii, *Benth.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Paundai, *Etah.*, *See* Iron sulphate.
Dye ;

Pautti, *Tel.*, Gossypium herbaceum, *Linn.*, MALVACEÆ.
Fibre ;

Pává, *Tam.*, Schleichera triguga. *Willd.*, SAPINDACEÆ.
Oil ;

Payala, *Gurhw.*, Buchania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ;Tan ;

Payaudesh, *Kumaun.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan , Fibre ;

Payani, *Mal.*, Valeria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Payaungban, *Burm.*, Thevetia neriifolia, *Linn.*, APOCYNACEÆ.
Oil ;

Paycoomuti, *Tan.*, Citruleus Colocynthis, *Schrad.*, CUCURBITACEÆ.
Oil ;

Payé, *Burm.*, Citruilus vulgaris, *Schrad.*, CUCURBITACEÆ.
Oil ;
Payirrik, *Lepcha*, Acacia Intsia, *Willd.*, LEGUMINOSÆ.
Dye ;
Pa-yok, *Burm.*, Camphor.
Peach, *Eng.*, Prunus persica, *Benth.*, ROSACEÆ.
Gum ; Oil ;
Peacock-grease,
Oil ;
Pear, Avocado, *Eng.*, Persea gratissima, *Gaertn.*, LAURINEÆ.
Oil ;
Pear, Prickly, *Eng.*, Opuntia Dillenii, *How.*, CACTEÆ.
Fibre ;
Pebeng, *Burm.*, Corypha umbraculifera, *Linn.*, PALMÆ.
Fibre ;
Pedda, *Tel.*, Ailanthus excelsa, *Roxb.*, SIMARUBEÆ.
Gum ;
Pedda, *Tel.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Fibre ;
Pedda-are, *Tam.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Pedda chintu, *Tel.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Pedda dosray, *Tel.*, Cucumis melo, *L.*, *forma* Momordica (*Sp. Roxb.*) CUCURBITACEÆ. Oil ;
Pedda duchirram, *Tel.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;
Pedda eita, *Tel.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ;
Peddagi, *Tel.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Pedda Jila-kurra, *Tel.*, Fæniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;
Pedda-kai, *Tel.*, Cucumis Melo, *L.*, *forma* Momordica (*Sp. Roxb.*), CUCURBITACEÆ. Oil ;
Peddakunji, *Tel.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;
Pedda-nowli-eragu, *Tel.*, Ulmus integrifolia, *Roxb.*, URTICACEÆ.
Oil ;
Pedda-patseru, *Tel.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;
Pedda sopara, *Tel.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Peddi-jovi, *Tel.*, Ficus Tsiela., *Roxb*, URTICACEÆ.
Fibre ;
Pedega, *Tel.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Pedei, *Tel.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Pedu, *Tel.*, Ailanthus excelsa, *Roxb.*, SIMARUBEÆ.
Gum ;
Pee, *Tam.*, Ailanthus excelsa, *Roxb.*, SIMARUBEÆ.
Gum ;
Peechenggah, *Mal.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;
Peekun-kai, *Tam.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;
Peepul, *Eng.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;
Peingnai, *Burm.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Peirah, *Oudh*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ;
Peka, *Hind*, Bambusa Tulda., *Roxb.*, GRAMINEÆ.
Fibre ;
Pe-karakai., *Tam.*, 'Terminalia paniculata, *W & A.*, COMBRETACEÆ.
Dye ; Tan ;
Peneji, *Lepcha*, Bricdelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Pen-kottai, *Tam.*, Anamirta Cocculus, *W & A.*, MENISPERMACEÆ.
Oils ;
Penti tadi, *Tel.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;
Pepper, Black, *Eng.*, Piper nigrum, *Linn.*, PIPERACEÆ.
Oil ;
Pepre, *Tam.*, Ficus infectoria., *Willd.*, URTICACEÆ.
Fibre ;
Perambu, *Tam.*, Calamus Rotang., *Linn.*, PALMÆ.
Fibre ;
Peramuti-pu, *Tam.*, Pavonia odorata, *Willd.*, MALVACEÆ.
Fibre ;
Periaeetcham, *Tam.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ; Fibre ;
Pérrah, *Oudh.*, Buchania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;
Peru, *Tam.*, Ailanthus excelsa, *Roxb.*, SIMARUBEÆ.
Gum ;
Peru, *Bom.*, Psidium Guava, *Raddi.*, MYRTACÆ.
Dye ; Tan ;
Peru-mara, *Tam.*, Ailanthus malabarica *DC.*, SIMARUBEÆ.
Gum ;
Perumbi, *Tam.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Perungayam, *Tam.*, Ferula alliacea, *Boiss.*, UMBELLIFERÆ.
Gum ;
Perungayam, *Tam.*, Felula Narthex, *Boiss.*, UMBELLIFERÆ.
Oil ;
Peruntutti, *Tam.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Peshora, *Pb.*, Parrotia Jacquemontiana, *Decaisne*, HAMAMELIDEÆ.
Fibre ;
Petari, *Beng.*, *Mahr.*, Abutilon asiaticum, *G.Don.*, MALVACEÆ.
Fibre ;
Petarkura, *Beng.*, Gynocardia odorata, *R.Br.*, BIXINEÆ.
Oil ;
Petha, *Pb.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Petha-kalabantha, *Tel.*, Agave vivipara, *Linn.*. AMARYLLIDEÆ.
Fibre ;
Pethra, *Him. name*, Juniperus communis, *Linn.*, CONIFERÆ.
Gum ;
Peyára, *Beng.*, Psidium Guava, *Raddi.*, MYRTACÆ.
Dye ; Tan ;
Phálasc, *Bom.*, Grewia asiatica, *Linn.*, MALVACEÆ.
Fibre ;
Phaldu, *Hind.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;
Phálsa, *Hind.*, *Sind.*, *Pb.*, Grewia asiatica, *Linn.*, MALVACEÆ.
Fibre ;
Phalsh, Populus balsamifera, *Linn.*, SALACINEÆ.
Gum ;
Phalwara, *Hind.*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oils ;

Phanasa, *Mahr.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;
Pharat-singhali, *Nepal*, Quercus lamellosa, *Sm.*, CUPULIFERÆ.
Tan ;
Pharkath, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Pharoah, *Hind.*, *Sind.*, *Pb.*, Grewia asiatica. *Lnin.*, MALVACEÆ.
Fibre ;
Pharra, *Beluch*, Chamærops Ritchiena, *Griff.*, PALMÆ.
Fibre ;
Pharsa, *Hind.*, Grewia tiliæfolia, *Vahl.*, LEGUMINOSÆ.
Fibre ;
Pharwa, *Pb.*, Grewia oppositifolia., *Roxb.*, MALVACEÆ.
Fibre ;
Phas, *Mahr.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;
Phasi, *Mahr.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Phatkiri, *Beng.*, Alum.
Mordant ;
Phenila, *Sans.*, Sapindus Mukorossi, *Gaertn.*, SAPINDACEÆ.
Oil ;
Pheni-mansa, *Beng.*, Opuntia Dillenii., *How.*, CACTEÆ.
Fibre ;
Phetya-kyee, *Burm.*, Laportea crenulata, *Gandich.*, URTICACEÆ.
Fibre ;
Phitkári, *Hind.*, Alum.
Mordant ;
Phootee, *See* Gossypium herbaceum, L, var. herbaceum proper, MALVCAEÆ.
Fibre ;
Phulahi, *Pb.*, Acacia modesta, *Wall.*, LEGUMINOSÆ.
Gum ;
Phulel, *Kumaun.*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oil ;
Phulsatti, *Mahr.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ;
Phulu, *Pb.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;
Phulwara, *Chenab*, Prinsepia utilis, *Royle.*, ROSACEÆ.
Oil ;
Phunti, *Beng.*, Cucumis Melo, *L.*, *forma* Momordica (*Sp. Roxb.*), CUCURBITACEÆ. Oil ;
Phut, *Hind.*, Cucumis Melo, *L.*, *forma* Momordica (*Sp. Roxb.*), CUCURBITACEÆ. Oil ;
Phutiki, *Tel.*, Grewia asiatica, *Linn.*, MALVACEÆ.
Fibre ;
Physic Nut, Jatropha Curcus, *Linn.*, EUPHORBIACEÆ.
Oil ;
Piál, *Garhwal*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;
Piár, *Oudh*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;
Piasal, *Beng.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Pichle, *Sylhet*, Bambusa nutaus, *Wall.*, GRAMINEÆ.
Fibre ;
Pienne, *Burm.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Dye ;
Pilchi, *Pb.*, Tamarix dioica, *Roxb.*, TAMARISCINEÆ.
Gum ; Dye ; Tan ;
Pilita, *And.*, Gnetum scandens, *Roxb.*, GNETACÆ.
Fibre ;

Pillah, *Tam.*, Artocarpus integrifolia, *Linn.*, URTICACEÆ.
Gum ; Dye ; Fibre ;

Pilu, *Mahr.*, Salvadora olevides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Pilu, *Sind.*, *Mahr.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;

Pinari, *Tam.*, Sterculia fœtida, *Linn.*, STERCULIACEÆ.
Oil ;

Pincho, *Sutlej.*, Debregeasia bicolar., *Wedd*, URTICACEÆ.
Fibre ;

Pindi-kai (seeds), *Kan.*, Myristica malabarica, *Lam.*, MYRISTICEÆ.
Oil ;

Pineymaram, *Tam.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ; Oil ;

Piney Varnish, *Eng.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;

Ping, *Cachar*, Cynometra, *sp.* ? polyandra, *Roxb.*, LEGUMINOSÆ.
Oil ;

Pinle kanazo, *Burm.*, Heritiera littoralis, *Dryand.*, STERCULIACEÆ.
Oil ;

Pinlekathit, *Burm.*, Erythrina indica, *Lam.*, LEGUMINOSEÆ.
Gum ; Dye ; Fibre.

Pinlé-on, *Burm.*, Carapa moluccensis. *Linn.*, MELIACEÆ.
Gum ; Oil ;

Pinna, *Tel.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;

Pinnay, *Tam.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;

Pipal, *Hind.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;

Pipudel, *Tam.*, Trichosanthes cucumerina, *Linn.*, CUCURBITACEÆ.
Gum ;

Piriya, *N. W.* P., Andropogon laniger, *Desf.*, GRAMINEÆ.
Fibre ;

Pista, *Beng.*, *Hind.*, and *Bom.*, Pistacia vera, *Linn.*, ANACARDIACEÆ
Gum ; Dye ; Oil ;

Pistachio Nut, *Eng.*, Pistacia vera. *Linn.*, ANACARDIACEÆ.
Gum ; Dye ;

Pita-bhringi, *Sans.*, Wedelia calendulacea, *Less.*, COMPOSITÆ.
Dye ;

Pitari, *Beng.*, Abutilon asiaticum, *G. Don*, MALVACEÆ.
Fibre ;

Pitraj, *Beng.*, Amoora Rohituka, W. *&* *A.*, MELIACEÆ.
Oil ;

Pitta, *Gond.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Pivala-bangra, *Mahr.*, Wedelia calenulacea, *Less.*, COMPOSITÆ.
Dye ;

Pivala-changra, *Mahr.*, Elipta alba, *Hassk.* COMPOSITÆ.
Dye ;

Pivalá chaphá, *Bom.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Oil ;

Pivala-maka, *Mahr.*, Wedelia calendulaccea, *Less.*, COMPOSITÆ.
Dye ;

Pivala máká, *Mahr.*, Eclipta Alba, *Hassk.*, COMPOSITÆ.
Dye ;

Piyáj, *Beng.*, Allium Cepa, *Linn.*, LILIACEÆ.
Oils ;

Piyál, *Bom.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ;

Piyáz, *Hind.*, Allium Cepa, *Linn.*, LILIACEÆ.
Oils

Plantain, *Eng.*, Musa paradisiaca, *Linn.*, SCITAMINEÆ.
Dye ; Fibre ;
Plum, *Eng.*, Prunus communis, *Huds.*, ROSACEÆ.
Gum ; Oil ;
Po, *Pb.*, Parrotia Jacquemontiana, *Decaisne*, HAMAMELIDEÆ.
Fibre ;
Podala-manu, *Tel.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ;
Podda-trin-gudda chettu, *Tel.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Oil ;
Pogada, *Tel.*, *Madras*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Gum ; Oil ;
Poghako, *Tel.*, Nicotiana tabacum, *Linn.*, SOLANACEÆ.
Oil ;
Poghei, *Tam.*, Nicotiana tabacum, *Linn.*, SOLANACEÆ.
Oil ;
Poguntig, *Lepcha*, Baliospermum montanum, *Müll-Arg.*, EUPHORBIACEÆ.
Oils ;
Poi, *Hind.*, Maoutia puaja., *Wedd.*, URTICACEÆ.
Fibre ;
Poidhanla, *Kumaun.*, Villebrunea frutescens, *Blume.*, URTICACEÆ.
Poka-vakka, *Tel.*, Areca Catechu, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Pol, *Hind.*, Basella cordifolia, *Lam.*, CHENOPODIACEÆ.
Dye ;
Pola, *Hind.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Gum ; Fibre ;
Polechee, *Mal.*, Hibiscus Sabdariffa, *Linn.*, MALVACEÆ.
Oil ;
Poli, *Pb.*, Carthamus oxyacantha, *Bieb.*, COMPOSITÆ.
Oil ;
Poma, *Ass.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;
Pomegranate, *Eng.*, Punica Granatuma, *Linn.*, LYTHRACEÆ.
Gum ;
Ponáu-kottai, *Tam.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ
Oil ;
Ponga, *Tam.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;
Pongoo, *Tam.*, Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;
Ponknway, *Burm.*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Gum ; Fibre ;
Pon nyet, *Burm.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;
Pooley-numajee, *Coimbatore*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Poon, *Mal.*, Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;
Poonam, *Mal.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ;
Poone, *Mal.*, Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;
Poone, (female) *Kan.*, Ochrocarpus, *Benth and Hook, f.* GUTTIFERÆ.
Dye ;
Poon Spar Tree, *Eng.*, Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;
Poon-yet, a Burmese resin.
Gum ;
Poota-tami, *Tam.*, Careya arboea, *Roxb.*, MYRTACEÆ.
Gum ;

Pooteli, *Nepal.*, Litsæa consimiles, *Nees.*, LAURINEÆ.
Oil ;

Poovana, Sarcostigma Kleinii, *W.* & *A.*, OLACINEÆ.
Oil ;

Poovenagah, Sarcostyma Kleinii, *W.* & *A.*, OLACINEÆ.
Oil ;

Poppy, *Eng.*, Papaver somniferum, *Linn.*, PAPAVERACEÆ.
Oil ;

Porasan, *Tam.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Porásu, *Uriya*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Poresh, *Beng.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ;

Poris, *Tam.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Portia, *Eng.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;

Poshur, *Beng.*, Carapa moluccensis, *Lam.*, MELIACEÆ.
Gum ; Oil ;

Post, *Beng.*, Papaver somniferum, *Linn.*, PAPAVERACEÆ.
Oil ;

Potari, *Hind.*, Kydia calycina, *Roxb*, MALVACEÆ.
Fibre ;

Pothi, *Pb.*, Elsholtzia polystachya, *Benth.*, LABIATÆ.
Dye ;

Potri, *Tel.*, Kydia calycina, *Roxb*, MALVACEÆ.
Fibre ;

Potrum, *Tel.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;

Potu-tadi, *Tel.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;

Poukpan, *Burm.*, Sesbania grandiflora, *Pers.*, LEGUMINOSÆ.
Gum ;

Pounanga, *Tam.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Gum ; Oil ;

Praong, *Lepcha*, Arundinaria Hookeriana, *Munro*, GRAMINEÆ.
Fibre ;

Pratapasa, *Sans.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Pri, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;

Pritu, *Chenab.*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Oil ;

Prong, *N.* W. P. Arundinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;

Prong, *Lepcha*, Arundinaria Hookeriana, *Munro*, GRAMINEÆ.
Fire ;

Prongnok, *Lepcha*, Arundinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;

Prusti. *Lepcha*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;

Pua, *Hind.*, Maontia puaja, *Wedd.*, URTICACEÆ.
Fibre ;

Pubbun, *Sind.*, Nelumbium speciosum, *Willd.*, NYMPHÆACEÆ.
Fibre ;

Puboora, *Sind.*, Nelumbium speciosum, *Welld.*, NYMPHÆAC
Fibre ;

Pudel, *Tam.*, Trichosanthes cucumerina, *Linn.*, CUCURBITACEÆ.
Gum ;

Pudmu-charini, *Sans.*, Hibiscus mutabitis, *Roxb.*, MALVACEÆ.
Fibre ;

Puia, *Hind.*, Böhmeria nivea, *H.* & *A.*, URTICACEÆ.
Fibre ;
Pulá, *Tam.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Púla, *Hind.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;
Puli, *Tam.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Puli patha, *Hind.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;
Pulla-dondur, *Tel.*, Bauhinia malabarica, *Roxb.*, LEGUMINOSÆ.
Gum ;
Pullibaghi, *Kan.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum ;
Pulua, *Beng.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Pumelo, *Eng.*, Citrus decumana, *Willd.*, RUTACEÆ.
Gum ;
Pummoon, *Lepcha*, Arundinaria racemosa, *Munro*, GRAMINEÆ.
Fibre ;
Pumpkin *Eng.*, Benincasa cerifera, *Savi.*, CUCURBITACEÆ.
Oil ;
Puna, *Tel.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;
Punag, *Beng.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Punar puli, *Kan.*, Garcinia morella, *Desrouss.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;
Púnás, *Tel.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;
Punday, *Kan.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Pundi, *See* Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Oil ;
Pundrika, *Kan.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Pung-chu, *Ladak*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Pungu, *Tel.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Gum ; Oil ;
Púnil, *Kan.*, Odina wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Pú, *Tam.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Púlachi, *Tam.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Pur, *Tel.*, Eriodendron anfractusoum, *DC.*, MALVACEÆ.
Gum ; Oil ;
Purasa, *Tam.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Purgur, *Hind.*, Hymenodectyon thyrsiflorum, *Wall.*, *See* H. EXCELSUM.
RUBICACEÆ. Dye ;
Puring, *Sutlej.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Purmiok, *Lepcha*, Thamnocalamus spathiflorus, *Munro*, GRAMINEÆ.
Fibre ;
Purni, *Afghan*, Pinus excelsa, *Wall.*, CONIFERÆ.
Gum ;
Puroa, *Lepcha*, Mallotus philippinensis, *Müll.*, *Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Pursa, *Tam.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ;

Puruni, *Nepal.*, Debregeasia leucophylla, *Wedd.*, URTICACEÆ.
Fibre ;
Pushini-kaia, *Tam.*, Cucurbita maxima, *Duchesne*, CUCURBITACEÆ.
Oil ;
Pusku, *Tel.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Putajan *Pb.*, Putranjiva Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;
Putiki, *Tel.*, Grewia asiatica, *Linn.*, MALVACEÆ.
Fibre ;
Putra-jiva, *Hind.*, Putranjiva Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;
Putsa kaya, *Tel.*, Citrullus Colocynthis, *Schrad.*, CUCURBITACEÆ.
Oil ;
Puvandi, *Tam..*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;
Puvela, *Cingh.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;
Puya, *Nepal.*, Maoutia puaja, *Wedd.*, URTICACEÆ.
Fibre ;
Pwainget, a Burmese resin.
Gum ;
Pwot-chau-beng, *Burm.*, Debregeasia longifolia, *Wedd.*, URTICACEÆ.
Fibre ;
Pyál, *Bom.*, Buchanania latifolia, *Roxb.*, ANACARDIACEÆ.
Gum ; tan ; Oil ;
Pyinma, *Burm.*, Lagerstrœmia Flos-Reginæ, *Rets.*, LYTHRACEÆ.
Gum ;
Pyinkado, *Burm.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Gum ; Oil ;
Pyrosyne, *Eng.*, (Oil of) Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Q

Quince, *Eng.*, Cydonia vulgaris, *Fourn.*, ROSACEÆ.
Oil ;
Qurtum, *Arab.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ;

R

Radhuni, Belati, *Beng.*, Pimpinella Anisum, *Linn.*, UMBELLIFERÆ.
Oil ;
Radish, *Eng.*, Raphanus sativus, *Linn.*, CRUCIFERÆ.
Oil ;
Ragha, *Kumaun*, Ables Webbiana, *Lindl.*, CONIFERÆ.
Gum ;
Ragi, *Tel.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ; Tan ;
Rai, *Tel.*, Ficus religiosa, *Linn.*, URTICACEÆ.
Gum ;
Rai, *Eng.*, *Hind,,* Brassica juncea, *H. F. & T. T.*, CRUCIFERÆ.
Oil ;
Rai, *Hind.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Rai, Kali, *Hind.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Rai, Sarisha, *Beng.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil
Raila, *C. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Rain, *Meywar*, Mimusops indica, *A. DC.*, SAPOTACEÆ.
Gum ; Oil ;

Raini, *Gond.*, Mimusops indica, *A. D. C.*, SAPOTACEÆ.
Oil ;

Raira, *Gus.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ.
Oil ;

Raisalla, *Hind.*, Pinus excelsa, *Wall.*, CONIFERÆ.
Gum ;

Rán-phanasa, Artocarpus hirsuta, *Lamk.*, URTICACEÆ.
Gum ;

Rajain, *Pb.*, Ulmus integrifolia, *Roxb.*, URTICACÆ.
Oil ;

Rajana, *Sans.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;

Rajani-gandha, *Beng.*, Polyanthes tuberosa, *Linn.*, LILIACEÆ.
Oil ;

Raj birij, *Nepal*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Rajika, *Hind.*, Brassica juncea, *H. F. & T. T.*, CRUCIFERÆ.
Oil ;

Rajika, *Sans.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Rakta-chandan, *Beng.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Oils ;

Rakta-chandan, *Sans.*, *Beng.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ. Dye ;

Rakta-kambal, *Beng.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ;

Rakta-kanchan, *Beng.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;

Rakta-kánchan, *Beng.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;

Rakta-kánchan, *Beng.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Dye ;

Raktapita, *Beng.*, Ventilago madraspatana, *Gaertn.*, RHAMNEÆ.
Gum ; Dye ; Fibre ;

Ral, *Bom.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;

Rámapatri, *Bom.*, Myristica malabarica, *Lam*,, MYRISTICEÆ.
Oil ;

Rámatila, *Bom.*, Guizotia abssyinica, *Cass.*, COMPOSITÆ.
Oil ;

Ramatulsa, *Bom.*, Ocimum gratissimum, *Linn.*, LABIATÆ.
Oil ;

Rámbána, *Bom.*, Typha elephantina, *Roxb.*, ZYPHACEÆ.
Fibre ;

Rám-bhendi, *Bom.*, Malachra capitata, *Linn*, MALVACEÆ.
Fibre ;

Ram-bhendi, *Mahr.*, Thespasia Lampas, *Dals.*, MALVACEÆ.
Fibre ;

Rámchettu, *Tel.*, Anona reticulata, *Linn.*, ANONACEÆ.
Dye ; Fibre ;

Ramhyem, *Lepcha*, Debregeasia longifolia, *Wedd.*, URTICACEÆ.
Fibre ;

Rámpát, *Ass.*, Strobilanthes flaccidifolius, *Nees.*, ACANTHACEÆ.
Dye ;

Ramphal, *Dec.*, Anona reticulata, *Linn.*, ANONACEÆ.
Dye ; Fibre ;

Ramraj, *Beng.*, Ochre.
Dye ;

Rám-sevari, *Mahr.*, Sesbania aculeata, *Pers.*, LEGUMINOSÆ.
Fibre ;

Rámsitá, *Tam.*, Anona reticulata, *Linn.*, ANONACEÆ.
Dye ; Fibre ;

Ram-til, *Beng.*, Guizotia abssyinica, *Cass.*, COMPOSITÆ.
Oil ;
Ramtulsi, *Beng.*, *Hind.*, Ocimum gratissimum, *Linn.*, LABIATÆ.
Oil ;
Ránahalada, *Bom.*, Curcuma Zedoaria, *Roscoe.* (*non-Roxb.*), SCITAMINEÆ.
Dye ;
Ránajáyaphala (seeds), *Bom.*, Myristica malabarica, *Lam.*, MYRISTICEÆ.
Oil ;
Ránakela, *Bom.*, Musa textilis., *Louis.*, *Nees.*, MUSACEÆ.
Fibre ;
Rán-amba, *Mahr.*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Rand, *Hind.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Rangchari, *Pb.*, Elsholtzia polystachya, *Benth.*, LABIATÆ.
Dye ;
Raniwalai, *Nepal*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Gum ; Oil ;
Ranján, *Pb.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan ; Fibre ;
Ranjana, *Beng.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Dye ; Oils ;
Ránjana, *Mahr.*, Mimusops hexandra, *Roxb.*, SAPOTACEÆ.
Gum ;
Ranturi, *Hind.*, Hibiscus esculentus, *Linn.*, MALVACEÆ.
Fibre ;
Rao, *Hind.*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;
Rape, *Eng.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Raralai, *Hind.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Rara-sarson, *Eng.*, Brassica campestris. *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Rarreah, *see* **Gossypium herbaceum**, *L.*, var. herbaceum proper, MALVACEÆ. Fibre ;
Rasant, *Hind.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Rasavanti, (the extract of) **Berberis aristata**, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Rashtu, *Sutlej.*, Rhus semialata., *Murray*, ANACARDIACEÆ.
Oil ;
Rasota, *Bom.*, the extract of **Berberis aristata**, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Rassaul, *Oudh*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Rassi, *see* **Astragalus hamosus**, *Linn.*, LEGUMINOSÆ.
Dye ;
Rassu kurundu, *Cingh.*, Cinnamomum zeylanicum, *Breyn.*, LAURINEÆ.
Dye ; Oil ;
Rasun, *Beng.*, Allium sativum, *Linn.*, LILIACEÆ.
Oil ;
Raswanti, (the extract) *Arab.*, Berberis Lycium, *Roxb.*, BERBERIEÆ.
Gum ;
Ratadel, *Ceylon*, Artocarpus incisa, *Linn.*, URTICACEÆ.
Gum ;
Ratámba, *Bom.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Mordant ;
Ratámbi, *Bom.*, Garcinia indica, *Chois.*, GUTTIFERÆ.
Oil ;
Ratanjut, *Hind.*, Onosma echioides, *L.*, BOROGINEÆ.
Dye ;

Ratmanti, *Nepal.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;

Rattanjot, *Pb.*, Ptonetilla nepalensis, *Hook.*, ROSACEÆ.
Dye ;

Ran, *Sutlej*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;

Rauli, *Ravi*,, Litsœa sp?, LAURACEÆ.
Oil ;

Rauli, *Pb.*, Litsœa zeylanica, *Nees.*, LAURINEÆ.
Oil ;

Raundra, *Banswara*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;

Rauni, *C. P.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Raunj, *Hind.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;

Ravi, *Tel.*, Ficus religiosa, *Linn.*, URTICACEÆ
Gum ; Tan ;

Rawásh, *Pb.*, *Afg.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Rázianeh, *Pers.*, Pimpinella Anisum, *Linn.*, UMBELLIFERÆ.
Oil ;

Re, *Chenab*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;

Rechanaka, *Sans.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Rechedá, *And.*, Aderanthera pavonina, *Linn.*, LEGUMINOSÆ.
Dye ;

Redwood, Indian, *Eng.*, Soymida febrifuga, *Adr. Juss.*, MELIACEÆ.
Gum ; Tan ;

Regi, *Tel.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Dye ; Tan ;

Reh, (see under) **Astragalus hamosus**, *DC.*, BERBERIDEÆ.
Dye ;

Rehan, *Hind.*, (seed of) Ocimum Basilicum, *Linn.*, var. pilosum, *Benth.*
LABIATÆ. Oil ;

Rellu-gaddi, *Tel.*, Saccharum spontaneum, *Linn.*, GRAMINEÆ.
Fibre ;

Rengha, *Tel.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Dye Tan ;

Reri, *Beng.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Oil ;

Reru, *Hind.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;

Resha-i-khetmi, *Bom.*, *Pers.*, (the root of) Althœa rosea, *Linn.*, MALVACEÆ.
See Dye ;

Reuchini, *Beng.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Revachimi, *Mahr.*, Garcinia morella, *Desr.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;

Rewand chini, *Pb.*, (leaf-stalks of) Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Rewari, *Pb.*, *Him.*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;

Reylu, *Tel.*, Cassia fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Rha, *Lepcha*, Bauhinia variegata, *Linn.*, LGEUMINOSÆ.
Gum ; Dye ; Tan ;

Rhia, *Ass.*, Bohmeria nivea., *H.* & *A.*, URTICACEÆ.
Fibre ;

Rhubarb, *Eng.*, Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;

Ri, *Him. name*, Pinus Gerardiana, *Wall.*, CONIFERÆ.
Gum ;
Riah, *Beng.*, Bohmeria nivea., *H. & A.*, URTICACEÆ.
Fibre ;
Rian, *Pb.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Ribás, *Pb.*, (leaf-stalks of) Rheum Emodi, *Wall.*, POLYGONACEÆ.
Dye ;
Rice, *Eng.*, Oryza sativa, *Linn.*, GRAMINEÆ.
Fibre ;
Richang, *Lahoul.*, Salix daphnoides, *Vill.*, SALICINEÆ.
Fibre ;
Ricin de Palma-christi, *Fr.*, Ricinus commumis, *Linn.*, EUPHORBIACEÆ.
Oil ;
Ricinus samenöl, *Germ.*, Ricinus communis, *Linn.* EUPHORBIACEÆ.
Rimda, *And.*, Hopea odorata, *Roxb.*, APOCYNACEÆ.
Gum ;
Ringal, *C. P.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil
Ringall, *Jaunsar*, Thamnocalamus spathiflorus, *Munro.*, GRAMINEÆ.
Fibre ;
Ringri, *Tel.*, Balanites Roxburghii, *Planch.*, SIMARUBEÆ.
Oils ;
Riúna, *Kumaun*, Mallotus philippinensis, *Mull.*, *Arg.*, EUPHORBIACEÆ.
Oil ;
Ritha, *Hind.*, Sapindus detergens, *Roxb.*, SAPINDACEÆ.
Gum ;
Ritha, *Hind.*, Sapindus trifoliatus, *Vahl.*, SAPINDACEÆ.
Gum ; Oil ;
Ritha, *Hind.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Ritha, *Hind.*, Sapindus Mukorossi, *Gaertn.*, SAPINDACEÆ.
Oil ;
Ritha, *Hind.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Oil ;
Roatanga., *Tel.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;
Rohan, *Hind.*, Soymida febrifuga, *Adr.*, *Juss.*, MELIACEÆ.
Gum ; Tan ;
Rohani, *Hind.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Dye ;
Rohina, *Beng.*, Soymida febrifuga, *Adr.*, *Juss.*, MELIACEÆ.
Gum ; Tan ;
Rohisha, *Bom.*, Andropogon schœnanthes, *Linn.*, GRAMINEÆ.
Oil ;
Rohituka, *Sans.*, Amoora Rohituka, *W. & A.*, MELIACEÆ.
Oils ;
Rohni, *Oudh*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;
Roli, *Kumaun*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Rondapatti, *Tel.*, Thespesia Lampas, *Dalz*, MALVACEÆ.
Fibre ;
Rori, *C. P.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Rosegavata, *Bom.*, Andropogon Schœnanthes, *Linn.*, GRAMINEÆ.
Oil ;
Rosewood of S. India, *Eng.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Rosselle, *Eng.*, Hibiscus Sabdariffa, *Linn.*, MALVACEÆ.
Fibre ; Oil ;

Rothes Sandelholz, *Ger.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;
Roussa paper grass, *Eng.*, Andropogon Schœnauthus, *Munro*, GRAMINEÆ.
Fibre ;
Rowli, *Pb.*, (root of) Geranium ? nepalense, *Sweet.*, GERANIACEÆ.
Dye ;
Royta, *Bhil.*, Soymida febrifuga, *Adr.*, *Juss.*, MELIACEÆ.
Tan ;
Rozelle, *Eng.*, Hibiscus sabdariffa, *Lnn.*, MALVACEÆ.
Fibre ;
Ruchia, *Hind.*, Cornus macrophylla., *Wall.*, CORNACEÆ.
Oil ;
Rudracks-hachettu, *Tel.*, Guazuma tomentosa, *Kunth.*, STERCULIACEÆ.
Fibre ;
Ruen, *Kumaun*, Mallottus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Ruglim, *Lepcha*, Celastrus paniculatus, *Willd.*, CELASTRINEÆ.
Oil ;
Rui, *Bom.*, *Sind.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Rui, *Hind.*, Gossypium herbaceum or arboreum *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Rui, *Bom.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Dye ; Fibre ;
Rui, *Pb.*, Gossypium herbaceum., *Linn.*, MALVACEÆ.
Fibre ;
Rúkh, *Pb.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;
Rúkhá, *Bom.*, Antiaris toxicaria, *Leech.*, URTICACEÆ.
Gum ;
Rukh baer, *Nepal*, Zizyphus rugosa, *Lamk.*, RHAMNEÆ.
Gum ;
Rúm, *Ass.*, Strobilanthes flaccidifolius, *Nees.*, ACANTHACEÆ.
Dye ;
Rumbal, *Bom.*, Gnetum scandens, *Roxb.*, GNETACEÆ.
Fibre ;
Rungbong, *Lepcha*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;
Rusá ghás, *Hind.*, Andropogon calamus aromaticus, *Royle*, GRAMINEÆ.
Oil ;
Rusot, *Bom.*, (the extract of) Barberis aristata, *DC.*, BERBERIDEÆ
Rusam, *Uriya*, Schleichera trijuga, *Willd.*, SAPENDACEÆ.
Oil ;
Ruswal, *Bom.*, (the extract of) Barberis aristata, *DC.*, BERBERIDEÆ.
Ruthal but, Ficus laccifera, *Roxb.*, URTICACEÆ.
Gum ;
Ryom, *Lepcha*, Mursdenia tinctoria, *R. Br.*, ASCLEPIADEÆ.
Dye ; Fibre ;

S

Sabajhi, *Sind.*, Ocimum Basilicum, *Linn.*, var. anisatum, *Benth* , LABIATÆ.
Oil ;
Sabzah, *Dec.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ;
Sadarai, *Beng.*, Brassica campestris, *Linn.*, CRUCIFERÆ.
Oils ;
Sadbarg, *Pb.*, Calendula officinalis, *Linn.*, COMPOSITÆ.
Oil ;
Sadikka, *Cingh.*, Myristica moschata, *Willd.*, MYRISTICEÆ.
Oil ;

Sadora; *Hyderabad*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Sadri, *Hind.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Saduri, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Oil ;

Safed-ak, *Hind.*, Calotropis gigantea, *R. Br.*, ASCLEEPIADEÆ.
Gum ;

Safed-Bhopala, *Bom.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;

Safedar, *Pb.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;

Safedar, *Pb.*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;

Safed-dudiya, *Bom.*, Cucurbita Pepo, *DC.*, CUCURBITACEÆ.
Oil ;

Safed-ind, *Hind.*, *Beng.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;

Safed kikar, *Hind.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ,
Gum ; Dye ;

Safed-siris, *Hind.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Safflower, *Eng.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ; Oil ;

Saffron, *Eng.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;

Ság, *Mahr.*, *Bhil.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ;

Saga, *Tel.*, Sansevieria zeylanica, *Willd.*, LILIACEÆ.
Fibre ;

Saga, *Burm.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Gum ; Dye ;

Sagapu, *Tam.*, Hymenodictyon excelsum, *Wall.*, RUBIACEÆ.
Tan ;

Sagpaluk, *Hind.*, Spinacia oleracea, *Mill.*, SALSOLACEÆ.
Oil ;

Sagun, *Hind.*, *Beng.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Sagurgota, *Mahr.*, Cæsalpinia Bonducella, *Roxb.*, LEGUMINOSÆ.
Oil ;

Sagwan, *Mahr.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ;

Saháju, *Uriya*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Saherwa, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;

Saihan, *Tel.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;

Sáj, *Arab.*, *Pers.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Saj, *Hind.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Saji, *see* Astralagus hamosus, *Linn.*, LEGUMINOSÆ.
Dye ;

Sajna, *Beng.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;

Sakena, *Hind.*, Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ.
Fibre ;

Sakha-tungu-vern, *Tel.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ; Oil ;

Sakhu, *Hind.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;

Sakna, *Hind.*, Indigofera atropurpurea, *Ham.*, LEGUMINOSÆ.
Fibre ;

Sakoh, *Hind.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ;

Sakwa, *Nepal*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;

Sal, *Hind.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;

Sal, *Pers.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Sal Tree, *Eng.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ;

Sála, *Hind.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;

Saladhup, *Nepal*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Oil ;

Salai, *Beng.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;

Salaphali, *Mahr.*, Boswellia serrata, *Roxb.*, BURSERACEÆ.
Gum ;

Salbia, *Hind.*, Pterocarpus marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Salei, *Hind.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;

Salga, *Hind.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;

Salhe, *Hind.*, Boswellia serrata, *Colebr.*, BURSERACEÆ.
Gum ;

Salla, *Garhwal & Kumaun*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ;

Sallaki, *Sans.*, Boswellia serrata, *Roxb.*, BURSERACEÆ.
Gum ;

Salma, *Hind.*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ;

Sálmali, *Sans.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ;

Salopa, *Uriya*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;

Saltpetre, *see* Astragalus homosus, *DC.*, BERBERIDEÆ.
Dye ;

Salwa, *Hind.*, *Uriya.*, Sporea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;

Salzat, *Dec.*, Ocimum Basilicum, *Linn.*, OLEACEÆ.
Oil ;

Samadara, *Cingh.*, Samadera indica, *Gaertn.*, SIMARUBEÆ.
Oil ;

Samarri, *Hind.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;

Sambar, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;

Sama, *Pb.*, Phyllanthus nepalensis, *Müll. Arg.*, EUPHORBIACEÆ.
Tan ;

Samada, *Sind.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Samaloo, *Hind.*, Vitex Nigundo, *Linn.*, VERBENACEÆ.
Dye ;

Samaloo, Panika, *Hind.*, Vitex Nigundo, *Linn.*, VERBENACEÆ.
Dye ;

Samanka, *Hind.*, Citrullus vulgaris, *Schrad.*, CUCURBITACEÆ.
Oil ;

Samaratul-asl, *Arab.*, Tamarix articulata, *Vahl.*, T. dioca *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;

Sambe, *Burm.*, Jasminum Sambac, *Aiton.*. OLEACEÆ.
Oil ;

Sambhalu, *Hind.*, Vitex trifolia, *Linn.*, VERBENACEÆ.
Oil ;

Sami, *Sind*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Samprani, *Travancore*, Hardwickia pinnata, *Roxb.*, LEGUMINOSÆ.
Gum ;

Samsem, *Ravi.*, Jasminum officinale, *Aiton.*, OLEACEÆ.
Oil ;

Samsundra, *Hind.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;

Samudra palak, *Sans.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oils ;

Samudra shoka, *Mahr.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ.
Oil ;

Samundar, *Beng.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;

Samundar phul, *Hind.*, Barringtonia acutangula, *Gaertn.*, MYRTACEÆ.
Tan ;

Samur, *Gond*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

San, *Beng.*, *Hind.*, Crotalaria juncea, *Linn.*, LEGUMINOSÆ.
Fibre ;

Sana-kadan, *Lepcha*, Garcinia stipulata, *T. And.*, GUTTIFERÆ.
Gum ;

Sanalinga, *Tel.*, Cinnamomum zeylanicum, *Breyn.*, LAURINEÆ.
Dye ; Oil ;

Sandaku, *Burm.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Sandal, *Hind.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Sandal, Red, *Eng.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;

Sandal wood, *see* Santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Sandal wood, True, *Eng.*, santalum album, *Linn.*, SANTALACEÆ.
Oil ;

Sandalo Rose, *It.*, Pterocarpus Santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;

Sandan, *Hind.*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;

Sandari, *Uriya*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Sandbox Tree, *Eng.*, Huracrepitans, *Linn.*, EUPHORBIACEÆ.
Oil

Sandel-hout, *Dan.*, Pterocarpus santalinus. *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;

Sanders, Red, *Eng.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;

Sane, *Tel.*, Cicer arietinum, *Linn.*, LEGUMINOSÆ.
Dye ;

Sangran, *Hind.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;

Sanjna, *Hind.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ; Oil ;

Sankokla, *Dec.*, *Hind.*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Fibre ;

Sanni-nayan, *Cingh.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;

Sanoli, *Pb.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;

Sansaru, *Chenab*, Debrigeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Sanshap, *Sans.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;
Santale, Rouge, *Fr.*, Pterocarpus santalinus, *Linn, f.*, LEGUMINOSÆ.
Dye ;
Santavin, *Mahr.*, Alstonia scholaris, *R. Br.*, APOCYNACEÆ,
Gum ;
Santha, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Saochála, *Kumaun*, Bohmeria macrophylla, *Don.*, URTICACEÆ.
Fibre ;
Saori, *Berar*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;
Sapsha-pen, *Burm.*, Sponia orientalis, *Planch.*, URTICACEÆ.
Gum ;
Sapári, *Mahr.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ; Dye ;
Saphari Kumhra, *Beng.*, Cucurbita moschata, *Duchesne*, CUCURBITACEÆ.
Oil ;
Saphetasavara, *Mahr.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Gum ;
Saphijirik, *Lepcha*, Toddalia aculeata, *Pers.*, RUTACEÆ.
Dye ;
Sapin, *Gurhwal & Kumaun*, Pinus longifolia, *Roxb.*, CONIFERÆ.
Gum ; Tan ;
Sapodilla, *Eng.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Sapota, *Eng.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Sappan, wood, *Eng.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Sapsha, *Burm.*, Sarcochlamys pulcherrima, *Gaudich*, URTICACEÆ.
Fibre ;
Sapsha, *Burm.*, Bœhmeria Hamiltoniana, *Wedd.*, URTICACEÆ.
Fibr ;
Sara, *Hind.*, Litsæa zeylanica, *Nees.*, LAUR.
Oil ;
Sara, *Beng.*, Saccharum Mara, *Roxb.*, GRAMINEÆ.
Fibre ;
Sara, *Hind.*, Saccharum Mara, *Roxb.*, GRAMINEÆ.
Fibre ;
Sarap, *Afghan*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Sarci, *C. P.*, Shorea robusta, *Gaertn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ; Oil ;
Sardine Oil, *Eng.*,
Oil ;
Saripha, *Hind.*, Anona squamosa, *Linn.*, ANONACEÆ.
Fibre ;
Sarkara, *Hind.*, Saccharum Mara, *Roxb.*, GRAMINEÆ
Fibre ;
Saroli, *Pb.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan ; Fibre ;
Sarota, *Pb.* Garuga pinnata, *Roxb.*, BURSERACEÆ.
Gum ; Tan ;
Sarpat, *Hind.*, Saccharum Mara, *Roxb.*, GRAMIMEÆ.
Fibre ;
Sarpat, *Pb*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Sarra, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;

Sarru, *Tibet*, Cupressus torulosa, *Don.*, CONIFERÆ.
Gum ;
Sarsaparilla, *Eng.*, *see* Ichnocarpus frutescens., *Br.*, APOCYNACEÆ.
Fibre ;
Sarshapa, *Sans.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ.
Oil ;
Sarson, *Eng.*, *Hind.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ. Oil ;
Sarson, *Hind.*, Brassica juncea, *H. F. & T. T.*, CRUCIFERÆ.
Oil ;
Sarson Kali, *Beng.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ. Oil ;
Sarson, Pila, *Hind.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Sarson, Rara, *Hind.*, Brassica campestris, *Linn*, var. Napus, CRUCIFERÆ.
Oil ;
Sarson, *Hind.*, Brassica compestris, *Linn.*, var. campestris, CRUCIFERÆ.
Oil ;
Sarul, *Kan.*, Bauhinia purpurea, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Fibre ;
Sasa, *Beng.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;
Sasi, *Ass.*, Aquilaria Agallocba, *Roxb.*, THYMELÆACEÆ.
Oils ;
Satthapu, *Burm.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;
Sati, *Beng.*, *Sans.*, Curcuma Zedoaria, *Roscoe* (*non-Roxb.*), SCITAMINEÆ.
Dye ;
Satián, *Hind.*, Alstonia scholaris, *R. Br.*, APOCYNACEÆ.
Satin-wood, *Eng.*, Chloroxylon Swietenia, *DC.*, MELIACEÆ.
Gum ;
Satpura, *Hind.*. Daphne papyracea, *Wall.*, THYMELÆACEÆ
Fibre ;
Sauchi, *Beng.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ.
Oil ;
Sauna, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Sausni, (color from) Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Sávara, *Mahr.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Tan ; Fibre ; Oil ;
Sawáli, *Pb.*, Alnus nitida, *Endl.*, CUPUILIFERÆ.
Dye Tan ; Fibre ;
Saya-wer, *Tam.*, Oldenlandia umbellata, *Linn.*, RUBIACEÆ.
Dye ;
Screwpine Fragrant, *Eng.*, Pandanus odoratissimus, *Willd.*, ANDANEÆ.
Fibre.
Se, *Burm.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;
Segapu, *Tam.*, Psidium Guava, *Raddi.*, MYRTACEÆ.
Dye ; Tan ;
Segapu-munthari, *Tam.*, Bauhinia variegata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ; Oil ;
Segata, *Bom.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;
Segavá, *Bom.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;
Sehna, *Hind.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Seikbilu, *Burm.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;

Sein, *Hind.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Seindi, *Berar*, Phœnix sylvestris, *Roxb.*, PALMÆ.
Gum ;

Sejáv-bin, *Burm.*, Cannabis sativa, *Linn.*, URTICACEÆ.
Fibre ; Oil ;

Selemnyok, *Lepcha*, Wrightia tomentosa, *Roem & Scheult*, APOCYNACEÆ.
Dye ;

Semadung, *Lepcha*, Abies dumosa, *Loudon.*, CONIFERÆ.
Gum ;

Semla, *Hind.*, Bauhinia retusa, *Ham.*, LEGUMINOSÆ.
Gum ;

Sempangam, *Tam.*, Michelia Champaka, *Linn.*, MAGNOLIACEÆ.
Dye ; Oil ;

Semru, *Gus.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Semul, *Beng.*, Bombax insigne, *Wall.*, MALVACEÆ.
Gum ;

Semul, *Hind.*, *Beng.*, Bombax, malabaricum, *DC.*, MALVACEÆ.
Oil ; Gum ; Dye ; Fibre ;

Semur, *Hind.*, *Beng.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Oil ;

Sendurgam, *Tam.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ; Oil ;

Senen, *Lepcha.*, Debregeasia leucophylla, *Wedd.*, URTICACEÆ.
Fibre :

Senibal, *Hind.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Gum ; Oil ;

Senjná, *Hind.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;

Seoli, *Hind.*, *Uriya.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;

Sephálíká, *Beng.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;

Seráya, *Mal.*, Ochrocarpus longifolicus, *Benth* and *Hook. f.*, GUTTIFERÆ.
Dye ;

Serei, *Afg.*, Quercus Ilex., *Linn.*, CUPULIFERÆ.
Tan ;

Serhnoyk, *Lepcha*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Gum ; Oil ;

Serougee, *see* Gossypium herbaceum, *L.* var, herbaceum, MALVACEÆ.
Fibre ;

Serpa, *Bhutia*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre.

Serva, *Tel.*, Casuarina equisetifolia, *Forster.*, CASUARINACEÆ.
Gum ; Tan ;

Sesame Oil, *Eng.*, Sesamum indicum, *Linn.*, PEDALENEÆ.
Oil ;

Sesamol, *Germ.*, Sesamum indicum, *Linn.*, PEDALENEÆ.
Oil ;

Seshing, *Bhutia*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;

Set barúwa, *Hind.*, Daphne papyracea, *Wall.*, THYMELÆACEÆ.
Fibre :

Seutha, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;

Sevari, *Mahr.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;

Sewti, *Pb.*, Rosa alba, *Linn.*, ROSACEÆ.
Oil ;

Sha, *Burm.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Shahasfaram, *Arab.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ;
Shaing, *Tam.*, Semecarpus Anacardium, *Linn.*, ANACARDIACEÆ.
Gum ;
Shajratur-ramman, *Arab.*, Punica Granatum, *Linn.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Shák-Tikto, *Beng.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;
Shaka, *Tam.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Shakai, *Afg.*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Shaka tunga, *Tel.*, Cyperus rotundus, *Linn.*, CYPERACEÆ.
Dye ;
Shalangu, *Pb.*, Litsæa zeylanica, *Nees.*, LAURINEÆ.
Oil ;
Shalanghi, *Ravi*,, Litsæa (Sp.) ? LAURINEÆ.
Oil ;
Shalapara, *Hind.*, Hibiscus mutabilis, *Roxb.*, MALVACEÆ.
Fibre ;
Shalgam, *Hind.*, *Beng.*, Brassica campestris, *Linn.*, var. Rapa, CRUCIFERÆ.
Oil ;
Shálí, *Pb.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;
Shalshi, *Nepal.*, Quercus lamellosa, *Sm.*, CUPULIFERÆ.
Tan ;
Shambalee, *Dec.*, Vitex Negundo, *Linn.*, VERBENACEÆ.
Dye ;
Shami, *Beng.*, *Uriya*, *Mahr.*, Prosopis spicigera, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Shamru, *Hind.*, Desmodium tiliæfolium, *G. Don.*, LEGUMINOSÆ.
Fibre ;
Shamuddirap-pach-ch-ai, *Tam.*, Argyreia speciosa, *Sweet.*, CONVOLVULACEÆ. Oils ;
Shandana-kattai, *Tam.*, Santalum album, *Linn.*, SANTALACEÆ.
Oil ;
Shanjan, *Oudh*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;
Shankeshvara, *Bom.*, Xanthium strummarium, *Linn.*, COMPOSITÆ.
Oil ;
Shank ta kera, *Burm.*, Citrus medica, *Willd.*, RUTACEÆ.
Gum ; Dye ; Oil ;
Shappat-tup-pu, *Tam.*, Hibiscus rosa-sinensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Shar, *Beng.*, Saccharum Mara, *Roxb.*, GRAMINEÆ.
Fibre ;
Sharabki-kar, *Dec.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Gum ;
Shasaungbething, *Burm.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Shasaungpyathat, *Burm.*, Euphorbia antiquorum, *Linn.*, EUPHORBIACEÆ.
Gum ;
Shati, *Beng.*, *Sans.*, Curcuma Zedoaria, *Roscoe* (*non-Roxb.*), SCITAMINEÆ.
Dye ;
Shawbya, *Burm.*, Sterculia fætida, *Linn.*, STERCULIACEÆ.
Oil ;
Shwé-pay-on, *Burm.*, Cucurbita maxima, *Duchesne*, CUCURBITACEÆ.
Oil ;
Shayakah, *Arab*, *Pers*, Astragalus ? *Sp.*, LEGUMINOSÆ.
Gum ;
Shayrang, *Tam.*, Semecarpus Anacardium, *Linn. f.*, ANACARDIACEÆ.
Oil ;

Shedbarwa, *Nepal.*, Daphne longifolia, *Meisn.*, THYMELÆACEÆ.
Fibre ;
Shegava, *Mahr.*, Moringa pterygosperma, *Gaertn.*, MORINGACEÆ.
Oil ;
Sheli-putsa, *Cingh.*, Citrullus Colocynthis, *Schrad.*, CUCURBITACEÆ.
Oil ;
Shelkanta, **Buro**, *Beng.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Gum ;
Shem, *Tam.*, Soymida febrifuga, *Adr. Juss.*, MELIACEÆ.
Gum ; Tan ;
Shembal, *Hind.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Shem paratie, *Tam.*, Gossypium arboreum, *L.*, MALVACEÆ.
Fibre ;
Shendri, *Mahr.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;
Shendri, *Mahr.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye ;
Shen-shandanum, *Tam.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;
Sherasa, *Mahr.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ.
Oil ;
Sherawane, *Trans-Indus*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Sheriman, *Tel.*, Anogeissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Sheta, *Hind.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Shevari, *Mahr.*, Sesbania grandiflora, *Pers.*, LEGUMINOSÆ.
Gum ;
Shevenar-vaymbu, *Tam.*, Indigofera aspalathoides, *Vahl.*, LEGUMINOSÆ.
Oil ;
Shewari, *Dec.*. Sesbania ægyptica., *Pers.*, LEGUMINOSÆ.
Fibre ;
Shial-kanta, *Beng.*, Argemone mexicana, *Linn.*, PAPAVERACEÆ.
Oils ;
Shidu, *Mechi*, Euphorbia antiquorum, *Linn.*, EUPHORBIACEÆ.
Gum ;
Shika, *Bom.*, *Dec.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Shimai-sapu, *Tel.*, Carum Carui., *Linn.*, UMBELLIFERÆ.
Oil ;
Shimai shomba, *Tam.*, Carum Carui, *Linn.*, UMBELLIFERÆ.
Oil ;
Shimarra, *N.-W. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Shimba, *Tam.*, Michelia Champaka, *Linn.*, MAGNOLIACEÆ.
Dye ; Oil ;
Shimti, *Mahr. Kan.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Shindi, *Mahr.*, Periploca sylvestris, *Roxb.*, ASCLEPIADEÆ.
Gum ; Fibre ;
Shinduga, *Tel.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum
Shing, *Sutlej.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Shingarf, *Hind.*, Cinnabar.
Dye ;
Shinghár, *Beng.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ; Oil ;
Shingr, *Beng.* (as in Gamble), Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;

Shioli, *Uriya*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Shiran, *Pb.*, Prunus armeniaca, *Linn.*, ROSACEÆ.
Gum ; Oil ;
Shirín, *Pb.*, Colchicum illyricum, , LILIACEÆ.
Oil ;
Shiri-Saraumarum, *Tel.*. Tamarix articulata, *Vahl.*, T. dioca, *Roxb.*, T. gallica, *Linn.*, TAMARISCINÆ. Gum ; Dye ; Tan ;
Shirlan, *Him. name*, Bombax malabaricum, *D.C.*, MALVACEÆ.
Gum ; Dye ; Fibre ;
Shiro, , Imperata arundinacea, *Cyrill.*, GRAMINEÆ.
Fibre ;
Shirol, *Garhwal*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Shirsha, *Pb.*, Albizzia stipulata, *Boivin.*, LEGUMINOSÆ.
Gum ;
Shirsha, *Hind.*, Brassica campestris, *Linn.*, var. *Napus.*, CRUCIFERÆ.
Oil ;
Shirushavukku-maram, *Tam.*, Tamarix articulata, *Vahl.*, T. dioca., *Roxb.* T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;
Shisham, *Mar.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Shisham, *Hind.*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;
Shoe-flower, *Eng.*, Hibiscus rosa-senensis, *Linn.*, MALVACEÆ.
Dye ; Fibre ;
Shor-guz, *Pers.*, Tamarix articulata, *Vahl.*, T. dioca., *Roxb.*, and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;
Shrol, *Pb.*, Alnus nitida, *Endl.*, CUPULIFERÆ.
Dye ; Tan ; Fibre ;
Shukpa, *Him. name*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;
Shukri, *Beng.*, Grewia asiatica, *Linn.*, MALVACEÆ.
Shuf-talu, *Pers.*, Prunus persica, *Benth.*, ROSACEÆ.
Gum ; Oil ;
Shúmak, *Tam.*, Cæsalpinia coriaria, *Willd.*, LEGUMINOSÆ.
Tan ;
Shur, *Hind.*, Saccharum Mara, *Roxb.*, GRAMINEÆ.
Fibre ;
Shurbuta, *Him. name*, Juniperus excelsa, *M. Bieb.*, CONIFERÆ.
Gum ;
Shuriya-mukti, *Beng.*, Helianthus annuns., *Linn.*, COMPOSITÆ.
Fibre ;
Shúrli, *Him. name.*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Shwan, *Trans-Indus*, Olea-ferruginea, *Royle*, OLEACEÆ.
Oil ;
Shwet-rai, *Eng.*, *Beng.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ. Oil ;
Shwet-simul, *Beng.*, Eriodendron anfructuosum, *DC.*, MALVACEÆ.
Gum ;
Shyama-lutta, *Beng.*, Ichnocarpus frutescens., *R. Br.*, APOCYNACEÆ.
Fibre ;
Shyona, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Siaru, *Ravi.*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre ;
Sibr, *Arab.*, Aloe vera, *Lam.*, LILIACEÆ.
Dye ; Fibre ;
Sida, *Hind. & Beng.*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;

Sidhartha, *Sans.*, Brassica alba, *H.f. & T. T.*, CRUCIFERÆ.
Oil ;
Siháru, *Hind.*, Nyctanthes Arbor-tristis, *Linn.*, OLEACEÆ.
Dye ;
Sigi, *Kan.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Sihar, *C. P.*, Bauhinia vahlii., *W. & A.*, LEGUMINOSÆ.
Fibre ;
Sikekai, *Bom.*, *Dec.*, Acacia concinna, *DC.*, LEGUMINOSÆ.
Dye ; Tan ;
Siláras, *Hind.*, *Bom.*, Liquidambar orientalis, *Miller.*, HAMAMELIDEÆ.
Gum ;
Sili, *Khasia*, Cephalostaclyon capitatum, *Munro*, GRAMINEÆ.
Fibre ;
Silim, *Lepcha*, Terminalia Chebula, *Rets.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;
Silikka, *Ass.*, Terminalia citrina, *Roxb.*, COMBRETACEÆ.
Dye ;
Silkaka, *Sans.*, Liquidamber orientalis, *Miller.*, HAMAMELIDEÆ.
Gum ;
Silk cotton tree, *Eng.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Tan ;
Silk-grass, *Eng.*, Yucca gloriosa, *Linn.*, LILIACEÆ.
Fibre ;
Silk Oak, *Eng.*, Grevillea robusta, *Kunn.*, PROTEACEÆ.
Gum ;
Silk, Vegetable, *Eng.*, Agave americana, *Linn.*, AMARYLLIDEÆ.
Fibre ;
Silver Fir, Himalayan, *Eng.*, Abies Webbiana, *Linnal.* CONIFERÆ.
Gum ;
Sill-kurta, *Cachar*, Dichopsis polyantha, *Benth.*, SAPATACEÆ.
Gum ;
Sim, *Chenab.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Sim, *N.-W. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Sima, *Tel.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Simal, *Hind.*, Bombax malabaricum., *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ;
Simal, *Lepcha*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Tan ;
Simal, Safed, *Hind.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;
Simati, *Bom.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Simbal, *Him. name*, Bombax malabaricum, *DC.*, MALVACEÆ.
Gum ; Dye ; Fibre ;
Simbolee, Murraya Kœnigii, *Spr.*, RUTACEÆ.
Oil ;
Simbrangrip, *Lepcha*, Luculia gratissima, *Sweet.*, RUBIACEÆ.
Dye ;
Simi, *Tam.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;
Simli, *Hind.*, Zizyphus vulgaris, *Lamk.*, RHAMNEÆ.
Gum ;
Simlú, *Pb.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ; Oil ;
Simong, *Lepcha*, Caryota urens, *Linn.*, PALMÆ.
Fibre ;
Simul, *Beng.*, Bombax malabaricum., *DC.*., MALVACEÆ.
Gum ; Dye ; Fibre ;

Simul, Shwet, *Beng.*, Eriodendron anfractuosum, *DC.*, MALVACEÆ.
Oil ;

Simvankarawa, *Burm.*, Piper Cubeba, *Linn*, *f.*, PIPERACEÆ.
Oil

Sinban-karawa, *Tel.*, Piper Cubeba, *Linn.*, PIPERACEÆ.
Gum ;

Sindan harallu, *N.-W. P.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;

Sindooka, *Sans.*, Vitex Negundo, *Linn.*, VERBENACEÆ.
Dye ;

Sindur, *Beng.*, Cinnabar.
Dye ;

Sinduri, *Tel.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Sindura, *Nepal.*, Mallotus philippinensis, *Mull.*, *Arg.*, EUPHORBIACEÆ.
Oil ;

Singhani, *Nepal.*, Arundinaria Hookeriana, *Munro*, GRAMINEÆ.
Fibre ;

Singnok, *Lepcha.*, Wendlandia tinctoria, *DC.*, RUBIACEÆ.
Mordant ;

Singraf, *Hind.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;

Singrauf, *Hind.*, Tetanthera laurifolia, *Lacq.*. LAURINEÆ.
Oil ;

Singuru, *Uriya*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Singyan, *Bhutia.*, Symplocos racemosa, *Roxb.*, STYRACEÆ.
Dye ; Tan ; Mordant ;

Sinjli, *Hind.*, Zizyphus vulgaris, *Lamk.*, RHAMNEÆ.
Gum ;

Sir, *Pers.*, Allium sativum, *Linn.*, LILIACEÆ.
Oil ;

Siragam, *Tam.*, Cuminum Cyminum, *Linn.*, UMBELLIFERÆ.
Oil ;

Sirai, *Hind.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Siran, *Hind.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;

Siras, *Hind.*, *Mahr.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;

Siras, *Dec.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum ;

Sirikone, *Tam.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;

Sirin, *Hind.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;

Siri-poone, *Kan.*, Calophyllum tomentosum, *Wight.*, GUTTIFERÆ.
Oil ;

Siris, *Beng.*, *Hind.*, *Bom.*, *Mahr.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;

Sirisha, *Beng.*, *Bom.*, *Mahr.*, Albizzia Lebbeck, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;

Sirki, *Pb.*, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;

Sirola, *Bom.*, Luffa actangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Sirsa, *Hind.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum ;

Sirshaf, *Pers.*, Brassica nigra, *Koch.*, CRUCIFERÆ.
Oil ;

Sissai, *Hind.*, *Oudh*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;

Sissoo, *Eng.*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;
Sissú, *Gus.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Sissu, *Hind*,, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;
Sisu, *Mahr.*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Sit, *Burm.*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ;
Sitsal, *Beng.*, *Nepal.*, *Oudh*, Dalbergia latifolia, *Roxb.*, LEGUMINOSÆ.
Oil ;
Sittamindi, *Tel.*, Ricinus communis, *Linn.*. EUPHORBIACEÆ.
Mordant ; Oil ;
Sittamunuk, *Tam.*, Ricinus communis, *Linn.*, EUPHORBIACEÆ.
Mordant ; Oil ;
Sittamutti, *Tam.*, Pavonia zeylanica, *Cav.*, MALVACEÆ.
Fibre ;
Sitto-udal, *Nepal.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;
Sivappu-kashuruk-kai, *Tam.*, Hibiscus sabdariffa., *Linn.*, MALVACEÆ.
Fibre ;
Snake-wood, *Eng.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ;
Soanjna, *Hind.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ; Oil ;
Soap-nut Tree, *Eng.*, Sapindus trifoliatus, *Vahl.*, SAPINDACEÆ.
Gum ; Oil ;
Soap-nut, *Eng.*, Sapindus Mukorossi, *Gaertn.*, SAPINDACEÆ.
Oil ;
Soap-nut, *Eng.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Gum ; Oil ;
Sohágá, *See* Borax.
Dye ;
Sohága, *Oudh*, Amoora Rohituka, .*W & A.*, MELIACEÆ.
Oil ;
Sohan, *Uriya*, Soymida febrifuga, *Adr.*, *Juss.*, MELIACEÆ.
Tan ;
Sohikire, *Tam.*, Fœniculam vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;
Soimi, *Gond.*, Soymida febrifuga, *Adr.*, *Juss.*, MELIACEÆ.
Tan ;
Sola, *Beng.*, Æschynomene aspera., *Linn.*, LEGUMINOSÆ.
Fibre ;
Somr, *Hind.*, *Beng.*, Bombax malabaricum, *DC.*, MALVACEÆ.
Oil ;
Somraj. *Beng.*, Vernonia anthelmintica, *Willd.*, COMPOSITÆ.
Oil ;
Sonajáhi, *Kumaun*, Jasminum homile, *Linn.*, OLEACEÆ.
Dye ;
Sonalú, *Garo*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Sont, *Hind.*, Fœniculum vulgare, *Gaertn.*, UMBELLIFERÆ.
Oil ;
Sooahu, *Tel.*, Dipterocarpus tuberculatus, *Roxb.*, DIPTEROCARPEÆ.
Gum ;
Sorakaya, *Tel.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Soriai-ka. *Tam.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Soy Bean, *Eng.*, Glycine Soja, *Lieb.*, LEGUMINOSÆ.
Oil ;

Spalwakka, *Afg.*, Calotropis procera, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Spear Grass, *Eng.*, Heteropogon contortus, *Linn.*, GRAMINEÆ.
Fibre ;
Spelane, *Pb.*, Peganum Harmata, *Linn.*, RUTACEÆ.
Dye ; Oil ;
Spermaceti,
Oil
Sphatikari, *Sans.*, Alum.
Mordant ;
Spikenard, *Eng.* Nardostachys Jatamansi., *DC.*, VALERIANACEÆ.
Oil ;
Sprag, *Kunawar*, Arumdinaria falcata, *Nees.*, GRAMINEÆ.
Fibre ;
Spruce, Fir (Himalayan), *Eng.*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;
Srama, *Hind.*, Ichnocarpus frutescens, *Br.*, APOCYNACEÆ.
Fibre ;
Sriphal, *Sans.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Storax, *Eng.*, Styrax officinale, *Linn.*, STYRACEÆ.
Gum ;
Storax, Liquid, *Eng.*, Liquidamber orientalis, *Miller.*, HAMAMELIDEÆ.
Gum ;
Strychnine, *Eng.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye
Sualu, *Ass.*, Tetranthera monopelata, *Roxb.*, LAURINEÆ.
Oil ;
Su, *Burm.*, Carthamus tinctorius, *Linn.*, COMPOSITÆ.
Dye ; Oil ;
Suiminta, *Tel.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;
Sujna, *Beng.*, Moringa pterygosperma, *Gaertn.*, MORINGACEÆ.
Gum ; Tan ; Fibre ; Oil ;
Sulád, *Hind.*, Lagenaria vulgaris, *D. C.* COMPOSITÆ.
Oil
Sullea, *Khasia*, Cephalostaclyon capitatum, *Munro*, GRAMINEÆ.
Fibre ;
Sulpha, *Beng.*, Peucedanum graveolens, *Benth.*, UMBELLIFERÆ.
Oil ;
Sultana champa, *Hind.*, *Beng.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ. Gum ; Oil ;
Sumáqe-amriqah, *Pers.*, *Arab.*, Cæslpinia coriara, *Willd.*, LEGUMINOSÆ.
Tan ;
Sumbol, *Bom.*, Nardostachys Jatamansi, *DC.*, VALERIANACEÆ.
Oil ;
Sumi, *Tel.*, Soymida febrifuga, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Súmlú, *Pb.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ; Oil ;
Summum, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Sun, *Pers.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ.
Dye ;
Sunaru, *Ass.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Sundal-ahmer, *Arab.*, Pterocarpus santalinus, *Linn. f.*, LEGUMINOSÆ.
Dye ;
Sundali, *Beng.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan ;
Sunder, *Beng.*, Heritiera littoralis, *Dryand.*, STERCULIACEÆ.
Oil ;

Sundri, *Beng.*, Heritiera littoralis, *Dryand.*, STERCULIACEÆ.
Oil ;
Sun flower, *Eng.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Oil ;
Sungung rik, *Lepcha*, Bauhinia Vahlii, *W. & A.*, LEGUMINOSÆ.
Gum ;
Suni, *Sutlej*, Jasminum officinale, *Liton.*, OLEACEÆ.
Oil ;
Suni, *Dec.*, *Hind.*, Hibiscus cannabinus., *Linn.*, MALVACEÆ.
Fibre ;
Sunkeswar, *Tel.*, Poinciana elata, *Linn.*, LEGUMINOSÆ.
Gum ;
Sunnee, *Saharunpore*, Hibiscus cannabinus, *Linn.*, MALVACEÆ.
Oil ;
Suntala, *Nepal.*, Citrus Aurantium, *Linn.*, RUTACEÆ.
Gum ;
Supári, *Hind.*, *Beng.*, Areca Catechu, *Linn.*, PALMÆ.
Gum ; Dye ; Fibre ;
Suppatnyok, *Lepcha.*, Tetranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;
Supta, *Hind.*, Flemingia congesta, *Roxb.*, var. nana, *DC.*, LEGUMINOSÆ.
Dye ;
Sur, *Sind.*, Arundo Karka, *Roxb.*, GRAMINEÆ.
Fibre ;
Surajmukhi, *Hind.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Oil ;
Suran, *C. P.*, Zizyphus rugosa, *Lamk.*, RHAMNEÆ.
Gum ;
Surangi, *Mahr.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;
Suranji, *Trade name.*, Morinda citrifolia, *Linn.*, citrifolia, RUBIACEÆ.
Dye ;
Sura-ponna, *Tel.*, Ochrocarpus longifolius, *Benth. & Hook. f.*, GUTTIFERÆ.
Dye ;
Surat, *Beng.*, Laportea crenulata, *Gandich.*, URTICACEÆ.
Fibre ;
Surbuli, *Ben.*, Oldenlandia umbellata, *Linn.*, RUBIACEÆ.
Dye ;
Suree, *Sind.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Tan ;
Sureya, *Cingh.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ; Oil ;
Súringán, *Pb.*, Colchicum illyricum, LILIACEÆ.
Oil ;
Suringi, *Mahr.*, *Kan.*, Chrocarpus longifolius, *Benth & Hook. f.*, GUTTIFERÆ.
Dye ;
Sursha, *Beng.*, Brassica campestris, var. campestris, *Linn.*, CRUCIFERÆ.
Oil ;
Sursi, *Hind.*, *Beng.*, Brassica campestris, *Linn.*, var. campestris, CRUCIFERÆ. Oil ;
Surtari, *C. P.*, Woodfordia floribanda, *Salisb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Súryakánta, *Bom.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Fibre ;
Suryamukhi, *Sans.*, Helianthus annuus, *Linn.*, COMPOSITÆ.
Oil ;
Suss, *Chenab*, Debregeasia bicolar, *Wedd.*, URTICACEÆ.
Fibre
Swanjera, *Sind.*, Moringa pterygosperma, *Gaertn.*, MORINGEÆ.
Gum ; Tan ; Fibre ;
Swet-akand, *Beng.*, Calotropis gigantea, *R. Br.*, GUTTIFERÆ.
Gum ;

Swet-berela, *Beng.*, Sida shombifolia, *Linn.*, MALVACEÆ.
Fibre ;

T.

Tad, *Gus.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;
Tada, *Mahr.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ;
Tafung-tse-of, *China.*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Tagarisha chettu, *Tel.*, Cassia fora, *Linn.*, LEGUMINOSÆ.
Dye ;
Tagashing, *Bhutia*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;
Taggai, *Hind.*, Tabernæmontana coronaria, *Willd.*, APOCYNACEÆ.
Dye ;
Taggar, *Hind.*, Tabernæmontana coronaria, *Willd.*, APOCYNACEÆ.
Dye ;
Tairi, *Hind.*, *Gus.*, *Beng.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;
Taj, *N. W. P.*, (Bark of) Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ;
Taj-bádshahi, *Hind.*, Astragalus hamosus, *Linn.*, LEGUMINOSÆ.
Dye ;
Taka miriyala, *Tam.*, Piper Cubeba, *Linn.*, PIPERACEÆ.
Gum ; Oil ;
Takbert, *Lepcha*, Bhœmeria malabarica, *Wedd.*, URTICACEÆ.
Fibre ;
Tak-bret, *Lepcha*, Villebrunea frutescens, *Blume.*, URTICACEÆ.
Fibre ;
Taki, *Nepal*, Bauhinia acuminanata, *Linn.*, LEGUMINOSÆ.
Oil ;
Takmur, *Lepcha*, Albizzia procera, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ;
Takoli, *Hind.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Takpo, *Lepcha*, Prunus persica, *Bth. & Hook.*, ROSACEÆ.
Gum ; Oil ;
Taksor, *Lepcha*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Tal, *Beng.*, *Hind.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ; Fibre ;
Tala, *Hind.*, *Sans.*, Borassus flabelliformis, *Linn.*, PALMEÆ.
Gum ;
Tala, *Cingh.*, Corypha umbraculifera, *Linn.*, PALMÆ.
Fibre;
Talbsu, *Tel.*, Sterculia urens, *Roxb.*, STERCULIACEÆ.
Gum ;
Tali, *Pb.*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;
Tali, *Beng.*, Dichopsis polyantha, *Benth.*, SAPOTACEÆ.
Gum ;
Talisapatri, *Tam.*, *Tel.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;
Talispatri, *Hind.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;
Talkar, *Pb.*, Celastrus senegalensis, *Lam.*, CELASTRINEÆ.
Oil ;
Talkh, *Pb.*, Colchicum illyricum, LILIACEÆ.
Oil ;

Tallow Tree, Chinese, *Eng.*, Excæcaria sebifera, *Müll. Arg.*, EUPHORBIACEÆ. Dye ; Oil ;

Talsiari, *Ravi.*, Debregeasia bicolor, *Wedd.*, URTICACEÆ.
Fibre ;

Tama-ka, *Burm.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ; Oil ;

Tamálá, *Bom.*, Cinnamomum Tamala, *Nees.*, LAURINEÆ.
Dye ;

Tamana, *Mahr.*, Lagerstrœmia Flos-Reginæ, *Rets.*, LYTHRACEÆ.
Gum ;

Tamara, *Tel.*, Nelumbium speciosum, *Willd.*, NYMPHŒACEÆ.
Fibre ;

Tamaray, *Tam.*, Nelumbium speciosum, *Willd.*, NYMPHŒACEÆ.
Fibre ;

Tamarind, *Eng.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Oil ;

Tamarta, *Tam.*, Avirrhoa Carambola, *Linn.*, GERANIACEÆ.
Dye ;

Tamayoke, *Burm.*, Wendlandia, tinctoria, *DC.*, RUBIACEÆ.
Mordant ;

Tambádá nagkesara, *Kan.*, Ochrocarpus longifolius, *Benth. & Hook. f.*, GUTTIFERÆ. Dye ;

Támbata, *Bom.*, Flacourtia Cataphracta, *Roxb.*, BIXINEÆ.
Oil ;

Tamravalli, *Tel.*, Rubia cordifolia, *Linn.*, RUBIACEÆ.
Dye ;

Tanaung, *Burm.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;

Tanaku, *Tam.*, Cochlospermum Gossypium, *DC.*, BIXINEÆ.
Gum ; Oil ;

Tandi, *Tel.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Tangar, *Tel.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Tangedu, *Tel.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Tangedu, *Tel.*, Xylia dolabriformis, *Benth.*, LEGUMINOSÆ.
Oil ;

Tangshing, *Bhutia*, Abies dumosa, *Loudon*, CONIFERÆ.
Gum ;

Tani, *Tam.*, *Tel.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Tánkalá, *Bom.*, Cassia Tora, *Linn*, LEGUMINOSÆ.
Dye ;

Tantaric, *Pb.*, Pistacia lentiscus, *Linn.*, ANACARDIACEÆ.
Oil ;

Tawthidin, *Burm.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Tantia, *Hind.*, Albizzia Lebbek, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;

Tapcukben, *Burm.*, Dalbergia paniculata, *Roxb.*, LEGUMINOSÆ.
Gum ;

Tar, *Salt Range.*, Marsdenia Roylei, *Wight.*, ASCLEPIADEÆ.
Fibre ;

Tar, *Hind.*, Borassus flabelliformis, *Linn.*, PALMÆ.
Gum ; Fibre ;

Tarak vepa, *Tel.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Gum ; Dye ;

Taramira, *Hind.*, Eruca sativa, *Lam.*, CRUCIFERÆ.
Oil ;

Taravada, *Bom.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Taree, *Kan.*, Terminalia catappa, *Linn.*, COMBRETACEÆ.
Dye ;

Taringi (male) *Kan.*, Ochrocarpus longifolius, *Benth & Hook. f.*, GUTTIFERÆ. Dye ;

Tarsta, *Dec.*, Cassia tora, *Linn.*, LEGUMINOSÆ.
Dye ;

Taru, *Kan.*, Terminalia Catappa, *Linn.*, COMBRETACEÆ.
Oil ;

Taruka vepu, *Tel.*, Melia Azedarach, *Linn.*, MELIACEÆ.
Oil ;

Tarwar, *Hind.*, Cassia auriculata, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Tashiari, *Nepal.*, Debregeasia longifolia, *Wedd.*, URTICACEÆ.
Fibre ;

Tat, *Him. name.*, Saccharum fuscum, *Roxb.*, GRAMINEÆ.
Fibre ;

Tatri, *Pb.*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Gum ; Oil ;

Tatri, *Pb.* Rhus semialata, *Murray*, ANACARDIACEÆ.
Oil ;

Tattunua, *C. P.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Tatua, *Chenab*, Prinsepia utilis, *Royle*, ROSACEÆ.
Oil ;

Tatura, *Pb.*, Impatiens Balsamina, *Linn.*, GERANIACEÆ.
Dye ;

Tatura, *Pb.*, Impartiens Edgeworthii, *Hook.*, GERANIACEÆ.
Oil ;

Taukkyan, *Burm.*, Terminalia tomentosa, *W. & A.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Taukkyan, *Burm.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Taungpeinné, *Burm.*, Artocarpus Chaplasha, *Roxb.*, URTICACEÆ.
Gum ;

Taur, *Pb.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Gum ;

Tau-theedin, *Burm.*, Mallotus philippinensis, *Mull.*, EUPHORBIACEÆ.
Dye ;

Tayan, *Burm.*, Excæcaria Agallocha, *Willd.*, EUPHORBIACEÆ.
Gum ;

Tazhan, *Tam.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ;

Tcheiray gulab, *Nepal*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;

Té, *Burm.*, Diospyros pyrrhocarpa, *Miq.*, EBENACEÆ.
Dye ;

Teak Tree, *Eng.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Tedlapal, *Tel.*, Wrightia tinctoria, *B. Br.*, APOCYNACEÆ.
Gum ; Dye ;

Teeshœ, *Naga*, Adhatoda Vasica, *Nees.*, ACANTHACEÆ.
Dye ;

Tega, *Kan.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ;

Teing nyet, *Burm.*, Cæsalpinia Sappan, *Linn.*, LEGUMINOSÆ.
Dye ;

Tejpát, *N.-W. P.*, *Beng.*, Cinnamomum Tamala, *Nees.*, LAURACEÆ.
Dye ;

Tek, *Tam.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;

Teka, *Gond.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ;

Tekata sij, *Beng.*, Euphorbia antiquorum, *Linn.*, EUPHORBIACEÆ.
Gum ;
Tekku, *Cingh.*, *Tam.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;
Tekreng, *Garo*, Canarium bengalense, *Roxb.*, BURSERACEÆ.
Gum ;
Teku, *Tel.*, Tectona grandis, *Linn.*, VERBENACEÆ.
Gum ; Dye ; Oil ;
Tél, *Beng.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Tél, Kála, *Hind.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Tél, Krisna, *Hind.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Tella, *Tel.*, Calotropis procera, *B. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Tella-gadda, *Tel.*, Allium sativum, *Linn.*, LILIACEÆ.
Oil ;
Tella-madu, *Tel.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Tella motku, *Tel.*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;
Tella pal, *Tel.*, Wrightia tomentosa, *Roem. & Scheult.*, APOCYNACEÆ.
Dye ;
Tella púnki, *Tel.*, Givotia rottleriformis, *Griff.*, EUPHORBIACEÆ.
Oil ;
Tella-túma, *Tel.*, Acacia leucophlœa, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;
Telli, *Uriya*, Wendlandia tinctoria, *D C.*, RUBIACEÆ.
Mordant ;
Tél, Míthá, *Hind.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Tél, Safed, *Hind.*, Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Telus, *Khandeish*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;
Teluti, *Uriya.*, Tamarindus indicum, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ;
Temburni, *Mahr.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ;
Tendu, *Hind.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ;
Tenna, *Tam.*, Cocos nucifera, *Linn.*, PALMÆ.
Fibre ; Oil ;
Tentul, *Beng.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ;
Tepor, *Ass.*, Garcinia Xanthochymus, *Hook. f.*, GUTTIFERÆ.
Gum ;
Teradá, *Bom.*, Impatiens Balsamina, *Linn.*, GERANIACEÆ.
Dye ;
Terra, Japonica, *Eng.*, Uncaria Gambier, *Hunter*, RUBIACEÆ.
Tan ;
Tessu, (flowers of) Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Dye ; Tan ;
Teteli, *Ass.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ;
Tetrobrik, *Lepcha*, Spatholobus Roxburghii, *Bth.*, LEGUMINOSÆ
Gum ;
Tetu, *Mar.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Tetuli, *Uriya*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Tetural, *Lepcha*, Shorea robusta, *Linn.*, DIPTEROCARPEÆ.
Gum ; Dye ; Tan ;

Thabyai-pyoo, *Burm.*, Eugenia Jambolana, *Lam.*, MYRTACEÆ.
Gum ; Dye ; Tan ;

Thagwa, *Burm.*, Cucumis sativus, *Linn.*, CUCURBITACEÆ.
Oil ;

Thain puchie pattai, *Tam.*, Guazuma tomentosa, *Kunth..* STERCULIACEÆ.
Fibre ;

Thakil, *Hind.*, Ougeinia dalbergioides, *Benth.*, LEGUMINOSÆ.
Gum ;

Thakootma, *Burm.*, Dolichandrone Rheedii, *Seem.*, BIGNONIACEÆ.
Fibre ;

Thala, *Mal.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ
Fibre ;

Thalaymarathu, *Cingh.*, Sapindus trifoliatus, *Linn.*, SAPINDACEÆ.
Gum ; Oil ;

Thalaytalum, *Tam.*, Pandanus odoratissimus, *Willd.*, PANDANEÆ.
Fibre ; Oil ;

Thale, *Burm.*, Punica Granatum, *Linn.*, LYTHERACEÆ.
Gum ; Dye ; Tan ;

Thalma, *Hind,,* Phœnix sylvestris, *Roxb.*, PALMÆ.
Fibre ;

Thamba, *Tel.*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;

Thame, *Burm.*, Avicennia officinalis, *Linn.*, VERBENACEÆ.
Tan ;

Thanat, *Burm.*, Cardia Myxa, *Linn*, BORAGINEÆ.
Dye ; Fibre ;

Thanat-ta, *Burm.*, Garcinia heterandra, *Wall.*, GUTTIFERÆ.
Gum ; Dye ;

Thanat-taw, Garcinia Morella, *Desrouse.*, GUTTIFERÆ.
Gum ; Tan ; Oil ;

Thanba-ya, *Burm.*, Citrus medica, *Linn.*, RUTACEÆ.
Gum ; Tan ; Oil ;

Thangi, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;

Thanu-wen, *Burm.*, Curcuma Zedoaria, *Roscoe* (*non-Roxb.*), SCITAMINEÆ.
Dye ;

Than-wen, *Burm.*, Crocus sativus, *Linn.*, IRIDACEÆ.
Dye ;

Thara, *Uriya*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;

Tharra, *Tel.*, Grewia tiliæfolia, *Vahl.*, LEGUMINOSÆ.
Fibre ;

Thawi, *Hind.*, Woodfordia floribunda, *Salisb.*, LYTHRACEÆ
Gum ; Dye ; Tan ;

Thayet, *Burm.*, Mangifera indica, *Linn.*, ANACARDIACEÆ.
Gum ; Dye ; Tan ; Oil ;

Thayet-thitsay, *Burm.*, Gluta elegans, *Wall.*, ANACARDIACEÆ.
Dye ;

Theiwa, *Burm.*, Bambusa tulda, *Roxb.*, GRAMINEÆ.
Fibre ;

Thelli, *Mal.*, Canarium strictum, *Roxb.*, BURSERACEÆ.
Gum ;

Then, *Burm.*, Maranta dichotoma, *Wall.*, MARANTACEÆ.
Fibre ;

Thengben, *Burm.*, Hibiscus tiliaceus, *Linn.*, MALVACEÆ.
Fibre ;

Thet-yén-ni, *Burm.*, Croton Pavana, *Hamilt.*, EUPHORBIACEÆ.
Oil ;

Thidin, *Burm.*, Bixa Orellana, *Linn.*, BIXINEÆ.
Dye

Thihothayet, *Burm.*, Anacardium occidentale, *Linn.*, ANACARDIACEÆ.
Gum ; Tan ; Oil ;

Thilak, *Pb.*, Wikstromia virgata, *Meisn.*, THYMELÆACEÆ.
Fibre ;

Thimban, *Burm.*, Hibiscus tiliaceus, *Linn.*, MALVACEÆ.
Fibre ;

Thinbaw-kyetsu, *Burm.*, Jatropha Curcas, *Linn.*, EUPHORBIACEÆ.
Gum ; Oil ;

Thinbawtamaka, *Burm.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ; Oil ;

Thinboung, *Burm.*, Phœnix poludosa, *Roxb.*, PALMÆ.
Fibre ;

Thingan, *Burm.*, Hopea odorata, *Roxb.*, DIPTEROCARPEÆ.
Gum ;

Thinwin, *Burm.*, Pongamia glabra, LEGUMINOSÆ.
Gum ;

Thinwin, *Burm.*, Pongamia glabra, *Vent.*, LEGUMINOSÆ.
Oil ;

Thitkado, *Burm.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Thitkyabo, *Burm.*, Cinnamomum zeylanicum, *Breyn.*, LAURINEÆ.
Dye ; Oil ;

Thitmagyi, *Burm.*, Albizzia odoratissima, *Benth.*, LEGUMINOSÆ.
Gum ;

Thitni, *Burm.*, Amoora Rohituka *W. & A.*, MELIACEÆ.
Oil ;

Thitse, *Burm.*, Melanorrhœa usitata, *Wall.*, ANACARDIACEÆ.
Gum ;

Thitsein, *Burm.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Tan ; Oil ;

Thityin, *Burm.*, Croton oblongifolius, *Roxb.*, EUPHORBIACEÆ.
Oil ;

Thohur, *Sind.*, Euphorbia neriifolia, *Linn.*, EUPHORBIACEÆ.
Gum ;

Thoognaychay, *Burm.*, Helicteres Isora, *Linn.*, STERCULIACEÆ.
Fibre ;

Thorali gunja, *Mahr.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Dye ; Oil ;

Thoras, *Kan.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Fibre ;

Thukkam kai, *Tam.*, Bryonia callosa, *Rottl.*, CUCURBITACEÆ.
Oil ;

Thula, *Beng.*, Bombax insigne, *Wall.*, MALVACEÆ.
Gum ;

Thulpudma, *Beng.*, Hibiscus mutabilis, *Roxb.*, MALVACEÆ.
Fibre ;

Thúner, *N.-W. P.*, Taxus baccata, *Linn.*, CONIFERÆ
Gum ; Dye ;

Thúnu, *Kashmir*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;

Thuringi, *Tam.*, Albizzia amara, *Boivin.*, LEGUMINOSÆ.
Gum ;

Thus, *Arab.*, *Hind.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;

Tidhara, *Hind.*, Euphorbia antiquorum, *Linn.*, EUPHORBIACEÆ.
Gum ;

Tigemotku, *Tel.*, Butea frondosa, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;

Tikta-raj, *Beng.*, Amoora Rohitooka, *W. & A.*, MELIACEÆ.
Oils ;

Tilapari, *Sans.*, Pterocarpus santalimus, *Linn. f.*, LEGUMINOSÆ.

Tilphar, *Pb.*, Impatiens Edgeworthii, *Hook.*, GERANIACEÆ.
Oil ;
Tilyagurjun, *Beng.*, Dipterocarpus turbinatus, *Gaertn., f.* DIPTEROCARPEÆ. Gum ; Oil ;
Timberee, *Cingh.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;
Tinnas, *Hind.*, Ougeinia dalbergioides, *Bth.*, LEGUMINOSÆ.
Gum ;
Tintil, *Beng.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Tintiri, *Beng.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Tintuli, *Uriya*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Tinyu, *Burm.*, Casuarina equisetifolia, *Forster*, CASUARINEÆ.
Gum ; Tan ;
Tinyu-ben, *Burm.*, Pinus Kasya, *Royle*, ROSACEÆ.
Gum ; Tan ;
Tirman, *Tel.*, Anogcissus latifolia, *Wall.*, COMBRETACEÆ.
Gum ; Dye ;
Tirunitrup-pattiri, *Tam.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;
Tisi, *Beng.*, Linum usitatissimum, *Linn.*, LINEÆ.
Fibre ; Oil ;
Tissi, *Nepal.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Titar, *Pb.*, Rhus succedanea, *Linn.*, ANACARDIACEÆ.
Oil ;
Titasappa, *Ass.*, Michelia Champaka, *Linn.*, MAGNOLIACEÆ.
Dye ;
Tit-kunga, *Beng.*, Dregea volubilis, *Bent.*, ASCLEPIADACEÆ.
Fibre ;
Titri, *Nepal.*, Tamarindus indica, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Mordant ; Oil ;
Titri, *Pb.*, Rhus semilata, *Murray*, ANACARDIACEÆ.
Oil ;
Titsappa, *Ass.*, Michelia Champaca, *Linn.*, MAGNOLIACEÆ.
Oil ;
Tiun, *Pb.*, Artocarpus Lakoocha, *Roxb.*, URTICACEÆ.
Gum ; Dye ; Fibre ;
Tivara, *Sind.*, Avicennia officinalis, *Linn.*, VERBENACEÆ.
Tan ;
Toandi, *Tel.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Dye ; Oil ;
Tobacco, *Eng.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;
Tongrong, *Garo*, Spondias mangifera, *Pers.*, ANACARDIACEÆ.
Gum ;
Toombe, *Hind.*, Legenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;
Toomutti, *Tam.*, Bryonia callosa, *Rottl.*, CUCURBITACEÆ.
Oil ;
Toon Tree, *Eng.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;
Tooth-Brush Tree, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;
Torana, *Mahr.*, Zizyphus rugosa, *Lamk.*, RHAMNEÆ.
Gum ;
Tore, *Hind.*, Brassica campestris *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Toriya, *Hind.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;

Toroof, *Hind.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;
Tos, *Ravi*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;
Tosikiya-si, *Burm.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oils ;
Totilla, *Cingh.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;
Toukyap, *Burm.*, Putranjwa Roxburghii, *Wall.*, EUPHORBIACEÆ.
Oil ;
Toung-oung, *Burm.*, Arenga sacchrifera, *Labill.*, PALMÆ.
Fibre ;
Toung-pung, *Magh.*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Toungthale, *Burm.*, Garcinia Cowa, *Roxb.*, GUTTIFERÆ.
Gum ; Dye ;
Tráyamána, *Bom.*, *Pers.*, Delphinium saniculæfolium, *Boiss.*, RANUNCULACEÆ. Dye ;
Tripa, *Mal.*, Cynometra ramiflora, *Linn.*, LEGUMINOSÆ.
Dye ; Oil :
Trual, *Pb.*, Impatiens Edgeworthii, *Hook*, GERANIACEÆ.
Oil ;
Tsatya, *Burm.*, Sarcochlamys pulcherrima, *Gandich.*, URTICACEÆ.
Fibre ;
Tseichyee, *Burm.*, Briedelia retusa, *Spreng.*, EUPHORBIACEÆ.
Tan ;
Tshama-cada, *Tel.*, Sanseviera zeylanica, *Willd.*, LILIACEÆ.
Fibre ;
Tsjana-kua, *Mal.*, Costus speciosus, *San.*, SCITAMINEÆ
Oil ;
Tsjeron-kandel, *Malay.*, Kandelia Rheedii, W. & *A.*, RHIZOPHOREÆ.
Dye ; Mordant ;
Tsonu, *Pb.*, Jasminum humile, *Linn.*, OLEACEÆ.
Dye ;
Tspa, *Burm.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;
Túk, *Lepcha*, Gynocardia odorata, *R. Br.*, BIXINEÆ.
Oil ;
Tukhmirihán, *Bom.*, Ocimum Basilicum, *Linn.*, var. pilosum, *Benth.*, LABIATÆ. Oil ;
Tukhril, *Lepcha*, Rhus senialata, *Murray*, ANACARDIACEÆ.
Oil ;
Tukm-i-Balesan (fruit), *Arab.*, Balsamodendron Opobalsamum, *Kunth.* BURSERACEÆ. Gum ;
Tukm-i-khitmi, *Bom.*, *Pers.*, (fruit of) Althœa rosea, *Linn.*, MALVACEÆ.
Dye ;
Tuksat, *Lepcha.*, Sponia politoria, *Planch.*, URTICACEÆ.
Fibre ;
Tuksur, *Lepcha.*, Bœhmeria Hamiltoniana, *Wedd.*, URTICACEÆ.
Fibre ;
Tul, *Pb.*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Tula, *Beng.*, Gossypium arborium, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Túla-lodh, *Beng.*, Wendlandia tinctoria, *DC.*, RUBIACEÆ.
Dye ; Mordant ;
Tulasa, *Bom.*, Ocimum sanctum, *Linn.*, var. sanctum, LABIATÆ.
Oil ;
Tulasi, *Hind.*, *Beng.*, Ocimum sanctum, var. villosum, *Roxb.*, *sp.*, LABIATÆ.
Oil ;
Tulatuli, *Mahr.*, Holostemma Rheedii, *Wall.*, ASCLEPIADACEÆ.
Fibre ;

Tulda, *Beng.*, Bambusa tulda, *Roxb.*, GRAMINEÆ.
Fibre ;

Tulip Tree, *Eng.*, Thespesia populnea, *Corr.*, MALVACEÆ.
Gum ; Dye ; Fibre ;

Tulsi, Babui, *Beng.*, *Hind.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Oil ;

Tulsi, *Beng.*, *Hind.*, Osimum sanctum, var. villosum, *Roxb.*, *sp.*, LABIATÆ.
Oil ;

Túma, *Tel.*, Acacia arabica, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ;

Tumak, *Hind.*, *Beng.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;

Tumba, *Hind.*, *Pb.*, Lagenaria vulgaris, *DC.*, CUCURBITACEÆ.
Oil ;

Tumba, *Mahr.*, Leucas cephalotes, *Spreng.*, LABIATÆ.
Oil ;

Tumbaca, *Hind.*, *Beng.*, Nicotiana Tabacum, *Linn.*, SOLANACEÆ.
Oil ;

Tumbika, *Tam.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;

Tumbika, *Tam.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ;

Tumbugai, *Tam.*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;

Tumi, *Tel.*, Diospyros melanoxylon, *Roxb.*, EBENACEÆ.
Gum ;

Tumika, *Tel.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ;

Tumil, *Tel.*, Diospyros Embryopteris, *Pers.*, EBENACEÆ.
Gum ; Dye ; Tan ; Oil ;

Tun, *Hind.*, *Beng.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Tunamarum, *Tan.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Tundu, *Kan.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Tung, *Kashmir*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;

Tung, *Pb.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;

Tung, *Beng.*, Malotus philippinensis, *Mull.*, *Arg.*, EUPHORBIACEÆ.
Dye ; Oil ;

Tunga, *N.-W. P.*, Rhus Cotinus, *Linn.*, ANACARDIACEÆ.
Dye ; Tan ;

Tunga, *Pb.*, Pistacia integerrima, *J. L. Stewart*, ANACARDIACEÆ.
Gum ; Dye ; Tan ;

Tungu, *Pb.*, Pistacia integerrima, *J. L. Stewart*, ANACARDIACEÆ.
Gum ;

Tuni, *Beng.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Tuntapoo oil.
Oil ;

Túpa, *Bom.*, Cedrela Toona, *Roxb.*, MELIACEÆ.
Gum ; Dye ;

Tupakariya, *Mahr.*, Sida carpinifolia, *Linn.*, MALVACEÆ.
Fibre ;

Turái, *Bom.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Turi, *Hind.*, *Sind.*, Luffa acutangula, *Roxb.*, CUCURBITACEÆ.
Oil ;

Turmeric, Wild, *Eng.*, Curcuma Aromatica, *Salisb.*, SCITAMINEÆ.
Dye ;

Turnip, *Eng.*, Brassica campestris, *Linn.*, var. Raha, CRUCIFERÆ.
Oil ;
Turnip, Swedish, *Eng.*, Brassica campestris, *Linn*, var. campestris, CRUCIFERÆ. Oil ;
Turu kali, *Mal.*, *Tam.*, Euphorbia Tirucalli, *Linn.*, EUPHORBIACEÆ.
Mordant ;
Tut, *Beng.*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Tuthinar, *Tam.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Tuti, *Hind.*, Cucumis melo, *L.* Momordica, *sp.*, *Roxb.*, CUCURBITACEÆ.
Oil ;
Tutri, *Hind.*, Morus indica, *Linn.*, URTICACEÆ.
Gum ;
Tutti, *Tam.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Tutturabenda, *Tel.*, Abutilon asiaticum, *G. Don.*, MALVACEÆ.
Fibre ;
Tuverica, *Sans.*, Brassica campestris, *Linn.*, var. Napus, CRUCIFERÆ.
Oil ;
Twottapat, *Burm.*, Mimusops manilkara, *Don.*, SAPOTACEÆ.
Gum ;

U

Udda, *Tel.*, Dolichandrone falcata, *Seem.*, BIGNONIACEÆ.
Fibre ;
Udal, *Hind.*, Sterculia villosa, *Roxb.*, STERCULIACEÆ.
Gum ;
Udar, *Hind.*, Sterculia villosa, *Roxb.*, STERCULIACEÆ.
Gum ;
Udesh, *Kumaun*, Alnus nepalensis, *D. Don.*, CUPULIFERÆ.
Dye ; Tan ; Oils ;
Udha, *Bom.*, Dendrocalamus Hamiltonii, *Nees.*, GRAMINEÆ.
Fibre ;
Udha, *Bom.*, Dendrocalamus strictus, *Nees.*, GRAMINEÆ.
Fibre ;
Ud-i-Balesán, *Arab.*, Balsamodendron Opobalsamum, *Kunth.*, BURSERACEÆ. Gum ;
Udis, *Nep.*, Alnus nepalensis, *D. Don.*, CUPULIFERÆ.
Dye ; Tan ; Oils ;
Udula, *Mahr.*, Albizzia stipulata, *Boivin*, LEGUMINOSÆ.
Gum ;
Ughai, *Tam.*, Salvadora oleoides, *Linn.*, SALVADORACEÆ
Dye ; Oil ;
Ughai, *Tam.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;
Ugúr, *Hind.*, *Beng.*, Aquilaria Agallocha, *Roxb.*, THYMELÆCEÆ.
Oil ;
Uk, *Sind.*, Calatropis gigantea, *R. Br.*, ASCLEPIADACEÆ.
Gum ;
Ukh, *Hind.*, *Beng.*, Saccharum officinarum, *Linn.*, GRAMINEÆ,
Fibre ;
Ulatkambal, *Beng.*, Abroma augusta, *Linn.*, STERCULIACEÆ.
Fibre ;
Ullah, *N.-W. P.*, Anthistiria arundinacæ, *Roxb.*, GRAMINEÆ.
Fibre ;
Ullo, *Nepal.*, Girardinia heterophylla, *Decaisne*, URTICACEÆ.
Fibre ;
Ullu, *Hind.*, Oroxylum indicum, *Benth.*, BIGNONIACEÆ.
Dye ; Tan ;

Ulu, *N.-W. P.*, Anthistiria arundinacæ, *Roxb.*, GRAMINEÆ.
Fibre ;

Umble, *Bom.*, Gnetum scandens, *Roxb.*, GNETACEÆ.
Fibre ;

Umul-koochi, *Beng.*, Cæsalpinia digyna, *Rol.*, LEGUMINOSÆ.
Oil ,

Undi, *Mahr.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ; Oil ;

Undum, *Hind.*, *Dec.*, *Pers.*, *Arab.*, Pterocarpus santalinus, *Linn.*, *f.*, LEGUMINOSÆ. Dye ;

Ungdung, *Burm.*, Teranthera laurifolia, *Jacq.*, LAURINEÆ.
Oil ;

Ungdung, *Burm.*, Tetranthera monopetala, *Roxb.*, LAURINEÆ.
Oil ;

Upoo-poma, *Tel.*, Khizophora mucronata, *Lamk.*, RHIZOPHOREÆ.
Tnn ;

Urm, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;

Usa, *Mahr.*, Saccharam officinarum, *Linn.*, GRAMINÆ.
Fibre ;

Ushak, *Pers.*, *Arab.*, *Bom.*, Dorema Ammoniacum, *Don.*, UMBELLIFERÆ.
Gum ; Oil ;

Ushar, *Arab.*, Calotropis gigantea., *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;

Ushit-tagari, *Tam.*, Cassia Tora, *Linn.*, LEGUMINOSÆ.
Dye ;

Usiki ulimidi, *Tel.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Usir, *Sans.*, Andropogon muricatus., *Rets.*, GRAMINEÆ.
Fibre ; Oils ;

Uskia, *Tel.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Usri, *Tel.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACÆ.
Gum ; Dye ; Tan ;

Utarana, *Sind.*, Dæmia extensa, *R. Br.*, ASCLEPIADEÆ.
Fibre ;

Utis, *Nepal.*, Alnus nepalensis, *D. Don.*, CUPULIFERÆ.
Dye ; Tan ; Oils ;

Utrej, *Arab.*, Citrus medica, *Linn.*, var. medica, RUTACEÆ.
Gum ; Tan ; Oil ;

Utta-remi, *Tel.*, Achyranthes aspera, *Linn.*, AMARANTACEÆ.
Dye ;

V

Vacha, *Sans.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oils ;

Vadaja, *Tel.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oils ;

Vándam-kottai, *Tam.*, Prunus amygdalus, *Baill.*, ROSACEÆ.
Gum ; Oil ;

Vadatalla, *Tam.*, Dichrostachys cinerea, *W. & A.*
Gum ;

Vaghe, *Tam.*, Albizzia Lebbeck, *Benth.*, LEGUMINOSÆ.
Gum ; Tan ; Oils ;

Vaipallay yenny, *Tam.*, Wrightia tomentosa, *Rom.*, APOCYNACEÆ.
Oil ;

Vaj, *Arab.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oils ;

Vajradanti, *Mahr.*, Barleria prionitis, *Linn.*, ACANTHACEÆ.
Gum ;

Vake-nar, *Tam.*, Sterculia villosa, *Roxb.*, STERCULIACEÆ.
Gum ;

Vákerichebhate, *Bom.*, Cæsalpinia Digyna, *Rol.*, LEGUMINOSÆ.
Oil ;

Vales-uloo, *Tel.*, Guizotia abyssynica, *Cass.*, COMPOSITÆ.
Oil ;

Vallai-pandu, *Tam.*, Allium sativum, *Linn.*, LILIACEÆ.
Oil ;

Vallanga, *Tam.*, Feronia Elephantum, *Cor.*, RUTACEÆ.
Gum ; Oil ;

Vallay poondoo unnay, see Allium sativum, *Linn.*, LILIACEÆ.
Oils ;

Vallonea Oak, *Eng.*, Quercus Ægilops, *Linn.*, CUPULIFERÆ.
Dye ; Tan ;

Val-milaku, *Hind.*, *Tam.*, Piper Cubeba, *Linn.*, PIPERACAEÆ.
Gum ; Oil ;

Van, *Sind.*, Salvadora olevides, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Vana-bhenda, *Mahr.*, Urena lobata, *Linn.*, MALVACEÆ.
Fibre ;

Vanarája, *Sans.*, Bauhinia racemosa, *Lam.*, LEGUMINOSÆ.
Fibre ;

Vanboga, *Malayan*, Shorea Tumbuggaia, *Roxb.*, DIPTEROCARPEÆ.
Gum ;

Vánda, *Sans.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;

Vani, *Panj.*, Salvadora oleoïdes, *Linn.*, SALVADORACEÆ.
Dye ; Oil ;

Váranga, *Bom.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Ffbre ;

Varangada, *Bom.*, Kydia calycina, *Roxb.*, MALVACEÆ.
Fibre ;

Varnish tree, *Eng.*, Melanorrhœa usitata, *Wall.*, ANACARDIACEÆ.
Gum ;

Várshiki, *Sans.*, Jasminum Sambac, *Aiton*, OLEACEÆ.
Oil ;

Varuara, *Sans.*, Ocimum Basilicum, *Linn.*, var. pilosum, *Benth.*, LABIATEÆ.
Oil ;

Vasúk, *Beng.*, Adhatodo Vasica, *Nees.*, ACANTHACEÆ.
Gum ;

Vashambu, *Tam.*, Acorus calamus, *Linn.*, AROIDEÆ.
Oils ;

Vassuntagunva, *Tel.*, Mallotus philippinensis, *Müll. Arg.*, EUPHORBIACEÆ.
Oil ;

Vatta-terrippi, *Tam.*, Sida carpinifolia, *Linn.*, MALVACEÆ.
Fibre ;

Vatti kanni, *Tam.*, Macaranga tomentosa, *Wight.*, EUPHORBIACEÆ.
Gum ;

Vavilli, *Tel.*, Vitex trifolia, *Linn.*, VERBENACEÆ.
Oil ;

Vavoli, *Mahr.*, Mimusops Elengi, *Linn.*, SAPOTACEÆ.
Oil ;

Vayavarná, *Bom.*, Cratæva religiosa, *Forst.*, CAPPARIDEÆ.
Dye ;

Vazhaip pazham, *Tam.*, Musa paradisiaca, & M. sapientum, *Linn.* MUSACEÆ. Dye ; Fibre ;

Vedam, *Tel.*, Terminalia Calappa, *Linn.*, COMBRETACEÆ.
Dye ; Oil ;

Vedda vala, *Tam.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;

Vekhanda, *Mahr.*, Acorus Calamus, *Linn.*, AROIDEÆ.
Oil;

Vela, *Tam.*, Feronia Elephantum, *Corr.*, Rutaceæ.
Gum ; Oil ;
Veladode, *Mahr.*, Amomum subulatum, *Roxb.*, Scitamineæ.
Oil ;
Velaga, *Tel.*, Feronia Elephantum, *Corr.*, Rutaceæ.
Gum ; Oil ;
Velai-thuthi, *Tam.*, Abutilon polyandrum, *Schlect.*, Malvaceæ.
Fibre
Vella-marda, *Tam.*, Terminalia Arjuna, *Bedd.*, Combretaceæ.
Gum ; Dye ; Tan ;
Vella matti, *Tam.*, Terminalia Arjuna, *Bedd.*, Combretaceæ.
Gum ; Dye ; Tan ;
Vellani, *Eng.*, Quercus Ægilops, *Linn.*, Cupuliferæ.
Dye ; Tan ;
Vellari-verai, *Tam.*, Cucumis Melo, *Linn.*, Cucurbitaceæ.
Oil ;
Vella-Vengayam, *Tam.*, Allium Cepa, *Linn.*, Liliaceæ.
Oils ;
Vellay naga, *Tam.*, Anogeissus latifolia, *Wall.*, Embretaceæ.
Gum ; Dye ;
Vellay-putali, *Tam.*, Sterculia urens, *Roxb.*, Sterculiaceæ.
Gum ;
Vellerkrú, *Tam.*, Calotropis procera, *R. Br.*, Asclepiadaceæ.
Gum ; Dye ; Tan ; Fibre ;
Vellulli, *Tel.*, Allium sativum, *Linn.*, Liliaceæ.
Oils ;
Velturn, *Tel.*, Dichrostachys cinerea, *W. & A.*, Leguminosæ.
Gum ;
Vel-velam, *Tam.*, Acacia leucophlœa, *Willd.*, Leguminosæ.
Gum ; Dye ;
Vel-velam, *Tam.*, Acacia ferruginea, *DC.*, Leguminosæ.
Gum ;
Vendaik-kay, *Tam.*, Hibiscus esculentus, *Linn.*, Malvaceæ.
Fibre ;
Vendaik-kaya, *Tel.*, Hibiscus esculentus, *Linn.*, Malvaceæ.
Fibre ;
Vendale, *Tam.*, Givotia rotherifarmis, *Griff.*, Euphorbiaceæ.
Oil ;
Vendayam, *Tam.*, Trigonella Fœnum-grœcum, *Linn.*, Leguminosæ.
Dye ; Oil ;
Vndi, *Tam.*, Hibiscus esculentus, *Linn.*, Malvaceæ.
Fibre ;
Vengai, *Tam.*, Pterocarpus Marsupium, *Roxb.*, Leguminosæ.
Gum ; Dye ; Tan ; Oil ;
Vepali, *Tam,*, Holarrhena antidysenterica, *Wall.*, Apocynaceæ.
Oil ;
Veppalay, *Tam.*, Holarrhena antidysenterica, *Wall.*, Apocynaceæ.
Oil ;
Veppam-vimbu, *Tam.*, Melia Azadirachta, *Linn.*, Meliaceæ.
Oil ;
Veppaula, *Tam.*, Holarrhena antidysenterica, *Wall.*, Apocynaceæ.
Oil ;
Veiasu, *Tam.*, Cordia Myxa. *Linn.*, Boragineæ.
Fibre ;
Veri, *Salt-range*, Marsdenia Roylei, *Wight*, Asclepiadeæ.
Fibre ;
Verk-kadalai, *Tam* , Arachis hypogœa, *Linn.*, Leguminosæ.
Oils ;
Verushanagakáya, *Tel.*, Arachis hypogœa, *Linn.*, Leguminosæ.
Oils ,
Vette-ver, *Tam.*, Andropogon muricatus, *Rets* Gramineæ.
Fibre ; Oils ;

Veypam, *Tam.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ;
Veritelnep, *Tel.*, Xanthium strumarium, *Linn.*, COMPOSITÆ.
Oil ;
Veta, *Mahr.*, Calamus Rotang, *Linn.*, PALMÆ.
Fibre ;
Vibudipatri, *Tel.*, Ocimum Basilicum, *Linn.*, LABIATÆ.
Fibre ; Oil ;
Vidi, *Tam.*, Cordia Myxa, *Linn.*, BORAGINEÆ.
Dye ; Fibre ;
Vijapúra, *Sans.*, Citrus medica, *Linn.*, *var.* medica, RUTACEÆ.
Oil ;
Vilayati babul, *Hind.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Vilayati kikar, *Hind.*, Acacia Farnesiana, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Vilayati mehndi, *Pb.*, Myrtus communis, *Linn.*, MYRTACEÆ.
Oil ;
Viláyeti-múng, *Dec.*, Arachis hypogœa, *Linn.*, LEGUMINOSÆ.
Oils ;
Vind, Saccharum Munja, *Roxb.*, GRAMINEÆ.
Fibre ;
Vilva-pazham, *Tam.*, Ægle Marmelos, *Corr.*, RUTACEÆ.
Gum ; Dye ; Tan ;
Visesh, *Bom.*, Boswellia floribunda, *Endl.*, BURSERACEÆ.
Gum ;
Vitriol, Green, *Eng.*, Proto-Sulphate of Iron.
Dye ;
Vodalai, *Tam.*, Acacia Catechu, Willd. LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Vun-paratie, *Tam.*, Gossypium herbaceum, *Linn.*, MALVACEÆ.
Fibre ;
Vurtuli, *Hind.*, Dichrostachys cinerea, *W. & A.*, LEGUMINOSÆ.
Gum ;
Vusayley-keeray, *Tam.*, Spinacia oleracea, *Mill.*, CHENOPODIACEÆ.
Oil ;

W

Wa, *Burm.*, Gossypium arboreum, *Linn.*, MALVACEÆ.
Fibre ; Oil ;
Wadalior, *Tam.*, Acacia Catechu, *Willd.*, LEGUMINOSÆ.
Gum ; Dye ; Tan ;
Wadinika, *Tel.*, Loranthus longiflorus, *Dex.*, LORANTHACÆ.
Dye ;
Wál seed, *Mahr.*, Adenanthera povoni na, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ;
Walena, *Hind.*, Sterculia colorata, *Roxb.*, STERCULIACEÆ.
Fibre ;
Wallunj, *Bom.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Walnut, *Eng.*, Juglans regia, *Linn.*, JUGLANDEÆ.
Dye ; Tan ; Oil ;
Walnut, Belgaum, *Eng.*, Aleurites moluccana, *Willd.*, EUPHORBIACEÆ.
Gum ; Oils ;
Wanash, *Pb.*, Rhus semialata, *Murray.*, ANACARDIACEÆ.
Oil ;
Waragu-wenki, *Tel.*, Salvadora persica, *Linn.*, SALVADORACEÆ.
Oil ;
Warga, *N.-W. P.*, Cassia Fistula, *Linn.*, LEGUMINOSÆ.
Gum ; Tan

Water-Melon, *Eng.*, Citrullus vulgaris, *Schrad.*, CUCURBITACEÆ.
Oil ;
Wattle, *see* Acacia arabica, *Willd.*, LEGUMINOSÆ.
Dye ;
Wattle, Bark Acacia decurreus, *Willd.*, LEGUMINOSÆ.
Dye ;
Wed-shaw, *Burm.*, sterculia colorata *Roxb.*, STERCULIACEÆ.
Fibre ;
Weaha, *Afg.*, Abies Smithiana, *Forbes*, CONIFERÆ.
Gum ;
Wetyar, *Pb.*, Juniperus recurva, *Ham.*, CONIFERÆ.
Gum ;
White Dammer, *Eng.*, Vateria indica, *Linn.*, DIPTEROCARPEÆ.
Gum ;
White wood tree, *Eng.*, Melaleuca Leucadendron, *Linn.*, MYRTACEÆ.
Oil ;
Willow, Weeping, *Eng.*, Salix babylonica, *Linn.*, SALICINEÆ.
Fibre ;
Winri, *Him. name*, Corylus Colurna, *Linn.*, CUPULIFERÆ.
Oil ;
Wodi, *Tel.*, Dolichandrone falcata, *Seem.*, BIGNONIACEÆ.
Fibre ;
Wodier, *Tam.*, Odina Wodier, *Roxb.*, ANACARDIACEÆ.
Gum ; Tan ; Fibre ;
Wond, *Tam.*, Saymida febrifuga, *Adr.*, *Jus.*, MILIACEÆ.
Tan ;
Wood-apple, *Eng.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Gum ;
Worm-wood, *Eng.*, Artemisia vulgaris, *Linn.*, COMPOSITÆ.
Oils ;
Wotiángil, *Kashmir*, Carpesium abrotanoides, *Linn.*, COMPOSITÆ.
Dye ;
Wuckoo-nar, *Eng.*, Crotalaria Juncea., *Linn.*, LEGUMINOSÆ.
Fibre ;
Wulawalli, *Tel.*, Dolichos biflorus, *Linn.*, LEGUMINOSÆ.
Oil ;
Wuma, *Kan.*, Calophyllum inophyllum, *Linn.*, GUTTIFERÆ.
Gum ;
Wúndi, *Kan.*, Ochrocarpus longifolius, *Benth. & Hook. f.*, GUTTIFERÆ.
Dye ;

Y

Yajya-domur, *Beng.*, Ficus Cunia., *Buch.*, URTICACEÆ.
Fibre ;
Yallande, *Tam.*, Zizyphus Jujuba, *Lam.*, RHAMNEÆ.
Dye ; Tan ;
Ya-mein, *Burm.*, Aporosa villosa, *Baill.*, EUPHORBIACEÆ.
Gum ;
Yapa, *Tel.*, Hardwickia binata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Yapa, *Tel.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Gum ; Oil ;
Yara, *Kashmir*, Pinus excelsa, *Wall.*, ROSACEÆ.
Gum ;
Yaythagyee, *Burm.*, Sesbania ægyptica, *Pers.*, LEGUMINOSÆ.
Fibre ;
Yeddi, *Tel.*, Andropogon contortus, *Linn.*, GRAMINEÆ.
Fibre ;
Yeddi, *Tel.*, Heteropogon contortus, *Linn.*, GRAMINACEÆ.
Fibre ;

Yeggi, *Tel.*, Pterocarpus Marsupium, *Roxb.*, LEGUMINOSÆ.
Gum ; Tan ; Oil ;
Yekka, *Kan.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Yel, *Lepcha.*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oils ;
Yelakulu, *Tel.*, Amomum Cardamomum, *Linn.*, SCITAMINEÆ.
Oils ;
Yelarsi, *Tam.*, Amomum Cardamomum, *Linn.*, SCITAMINEÆ.
Oils ;
Yelchi, *Kan.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ;
Yelinga, *Tel.*, Loranthus longiflorus, *Dex.*, LORANTHACEÆ.
Dye ;
Yella, *Mahr.*, Terminalia belerica, *Roxb.*, COMBRETACEÆ.
Gum ; Tan ;
Yellande, *Tam.*, Zizyphus Jujuba, *Lamk.*, LEGUMINOSÆ.
Gum ;
Yellanga, *Tel.*, Feronia Elephantum, *Corr.*, RUTACEÆ.
Oil ;
Yelloo-cheddie, *Tam.* Sesamum indicum, *Linn.*, PEDALINEÆ.
Oil ;
Yél paras, *Martaban*, Butea superba, *Roxb.*, LEGUMINOSÆ.
Gum ; Dye ; Fibre ;
Yel pote, *Lepcha*, Bassia butyracea, *Roxb.*, SAPOTACEÆ.
Oils ;
Yelta, *Tibet.*, Tamarix articulata, *Vahl.*, T. dioca, *Roxb.* and T. gallica, *Linn.*, TAMARISCINEÆ. Gum ; Dye ; Tan ;
Yenki, *Limbu.*, Maoutia Puya, *Wedd.*, URTICACEÆ.
Fibre ;
Yennai, *Tam.*, Neeradimootoo OIL.
Oil ;
Yenne, *Manjarabad* Hardwickia pinnata, *Roxb.*, LEGUMINOSÆ.
Gum ;
Yepa, *Tel.*, Melia Azadirachta, *Linn.*, MELIACEÆ.
Oil ;
Yeppa, *Tel.*, Bassia latifolia, *Roxb.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oil ;
Yeppa, *Tel.*, Bassia longifolia, *Willd.*, SAPOTACEÆ.
Gum ; Dye ; Tan ; Oils ;
Yercum, *Tam.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye, Tan ; Fibre ;
Yerica, *Mal.*, Calotropis gigantea, *R. Br.*, ASCLEPIADEÆ.
Gum ; Dye ; Tan ; Fibre ;
Yermaddi, *Tel.*, Terminalia Arjuna, *Bedd.*, COMBRETACEÆ.
Gum ; Dye ; Tan ;
Yerra chicatli, *Tel.*, Ventilago madraspatana, *Gaertn*, RHAMNEÆ.
Gum ; Dye ; Fibre ;
Yerra pátsaru, *Tel.*, Dalbergia lanceolaria, *Linn.*, LEGUMINOSÆ.
Oil ;
Yette, *Tam.*, Dalbergia Sissoo, *Roxb.*, LEGUMINOSÆ.
Oil ;
Yetti, *Tam.*, Hydnocarpus Wightiana, *Blume*, BIXINEÆ.
Oil ;
Yetti, *Tam.*, Strychnos Nux-vomica, *Linn.*, LOGANIACEÆ.
Dye ;
Yew, *Eng.*, Taxus baccata, *Linn.*, CONIFERÆ.
Gum ; Dye ;
Yeyo, *Burm.*, Morinda angustifolia, *Roxb.*, RUBIACEÆ.
Dye ;
Yeyo, *Burm.*, Morinda citrifolia, *Linn.*, RUBIACEÆ.
Dye ;

Yimmah, *Burm.*, Chikrassia tabularis, *Adr. Juss.*, MELIACEÆ.
Gum ; Dye ;
Yingat, *Burm.*, Gardenia obtusifolia, *Roxb.*, RUBIACEÆ.
Gum ;
Yir, *Kashm.*, Salix tetrasperma, *Roxb.*, SALICINEÆ.
Tan ;
Yolba, *And.*, Anadendrum paniculatum, AROIDEÆ.
Fibre ;
Yon, *Burm.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;
Yungan, *see* Dugong Oil.
Oil ;
Yung-beu, *Burm.*, Anogeissus acuminata, *Wall.*, COMBRETACEÆ.
Tan ;
Yúr, *Kashmir.*, Salix daphnoides, *Vill.*, SALICINEÆ.
Fibre ;
Yúru, *Pb.*, Quercus Ilex, *Linn.*, CUPULIFERÆ.
Tan ;
Ywegyi, *Burm.*, Adenanthera pavonina, *Linn.*, LEGUMINOSÆ.
Gum ; Dye ; Oil ;

Z

Zaitun, *Afg.*, Olea ferruginea, *Royle.*, OLEACEÆ.
Oil ;
Zambac, *Pers.*, Jasminum Sambac, *Aiton.*, OLEACEÆ.
Oil ;
Zambu, *Pb.*, Prunus Padus, *Linn.*, ROSACEÆ.
Gum ;
Zangar, Verdigris.
Dye ;
Zardalu, *Pb.*, Prunus communis, *Hud.*, ROSACEÆ.
Gum ; Oil ;
Zarir, *Arab.*, Delphinium saniculæfolium, *Bosis.*, RANUNCULACEÆ.
Dye ;
Zaungbale, *Burm.*, Lagerstrœmia parviflora, *Roxb.*, LYTHRACEÆ.
Gum ; Dye ; Tan ;
Zedoary, Long, *Eng.*, Curcuma Zedoaria, *Roscoe.*(*non-Roxb*), SCITAMINEÆ.
Dye ;
Zeeben, *Burm.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Gum ; Dye ; Tan ;
Zergul, *Pb.*, Calendula officinalis, *Linn.*, COMPOSITÆ.
Oil ;
Zi, *Burm.*, Zizyphus Jujuba, *Lamk.*, RHAMNEÆ.
Tan ;
Zibyu, *Burm.*, Phyllanthus Emblica, *Linn.*, EUPHORBIACEÆ.
Dye ;
Zimmaraddi, *Cawnpore*, see Iron Sulphate.
Dye ;
Zira, *Hind.*, Carum Caru, *Linn.*, UMBELLIFERÆ.
Oil ;
Zira, *Hind.*, Cuminum Cyminum, *Linn.* UMBELLIFERÆ.
Oil ;
Zirishk, *Pers.*, Berberis aristata, *DC.*, BERBERIDEÆ.
Dye ; Tan ;
Zirishk, (the fruit), *Pers.*, Berberis Lycium, *Royle*, BERBERIDEÆ.
Gum ;
Zolim-buriki, *Tam.*, Schleichera trijuga, *Willd.*, SAPINDACEÆ.
Oil ;